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PROPOSED Resource Management Plan and FINAL Environmental Impact Statement for the Kemmerer Field Office Planning Area

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Wyoming State Office - Kemmerer Field Office

Volume 2 of 2
Appendices, Glossary, and Maps

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

August 2008

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PROPOSED Resource Management Plan and FINAL Environmental Impact Statement for the Kemmerer Field Office Planning Area

Volume 2 of 2
Appendices, Glossary, and Maps

U.S. Department of the Interior
Bureau of Land Management
Kemmerer Field Office, Wyoming

August 2008

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KEMMERER
PROPOSED RESOURCE MANAGEMENT PLAN AND
FINAL ENVIRONMENTAL IMPACT STATEMENT

Appendix A

Conservation Measures for Threatened or Endangered Species; Conservation Agreements, and BLM-Endorsed Management Strategies for Special Status Species

Appendix A
Conservation Measures for Threatened or Endangered Species; Conservation Agreements, and BLM-Endorsed Management Strategies for Special Status Species

Management of special status species on public lands administered by the Bureau of Land Management (BLM) is directed by a variety of laws, policies, and other requirements. Special status species are those listed as threatened or endangered, are proposed for listing, or are candidates for listing under the provisions of the Endangered Species Act (ESA) or those designated by the BLM State Director as sensitive.

BLM Sensitive Species

The intent of the sensitive species designation is to ensure actions on the BLM-administered lands consider the welfare of these species and do not contribute to the need to list other Special Status Species under the provisions of the ESA. The BLM Wyoming State Office conducts an annual review of its sensitive species list to make additions or deletions based on the most current information on species status.

At the time of this writing, the planning area has 1 threatened plant species, 8 sensitive plant species, 4 endangered and 7 sensitive fish species, 1 threatened and 1 endangered wildlife species, 1 candidate wildlife species, and 24 sensitive wildlife species that may occur in the planning area. Three species of concern in the planning area were recently delisted from the ESA: the grizzly bear, the bald eagle, and the gray wolf. Wyoming BLM Sensitive Species Policy (BLM 2002) states that delisted species are automatically placed on the BLM sensitive species list.

Because management recommendations and status for sensitive species can, and do, change as new information is gathered, conservation recommendations for BLM-designated sensitive species are not presented in this appendix. Instead, interested individuals can find the latest recommendations for conservation as well as any agreements or management strategies for BLM sensitive species on the Wildlife Management Program page of the BLM Wyoming website at http://www.blm.gov/wy/st/en/programs/Wildlife.html.

Other websites containing conservation strategies for sensitive trout species include: http://www.fws.gov/mountain-prairie/species/fish/crct/ and http://wildlife.utah.gov/pdf/cacs7.pdf.

Species Listed Under the ESA

Section 7(a)(1) of ESA directs federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities that minimize or avoid adverse effects of a proposed action on listed species or critical habitats, help implement recovery plans, or develop information. The recommendations provided here relate to the proposed action only and do not necessarily represent complete fulfillment of the agency's section 7(a)(1) responsibility for these species.

For the USFWS to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the USFWS requests notification of the implementation of any conservation recommendations.

Conservation measures, conservation agreements, and BLM-endorsed management strategies for federally threatened, endangered, and candidate species are identified below.

CONSERVATION MEASURES

Plants

Ute Ladies'-tresses (Threatened)

The following section presents new conservation measures reviewed by all 10 Wyoming BLM field offices and agreed upon by all 10 field managers. These measures are taken from the BLM's *Final Report Statewide Programmatic Biological Assessment: Ute Ladies'-tresses Orchid (Spiranthes diluvialis)* (BLM 2005a) and modified as per the U.S Fish and Wildlife Service (USFWS) *Programmatic Biological Opinion for the Impacts for the Wyoming Bureau of Land Management's Resource Management Plans with Bureau-Committed Conservation Measures and the Effects to the Ute Ladies'-tresses Orchid (Spiranthes diluvialis)* (USFWS 2007). These measures are provided to outline opportunities to benefit populations of the orchid, and to help reduce or eliminate adverse effects from the spectrum of management activities on BLM land. These measures also outline opportunities to benefit the orchid, and to help avoid negative impacts through the thoughtful planning of activities. Implementation of these measures is expected to lead to conservation of the species.

These conservation measures are binding measures that the BLM will implement to facilitate conservation of the orchid. However, because it is impossible to provide measures that will address all possible actions in all locations across the range of the orchid, it is imperative that project-specific analysis and design be completed for all actions that could affect the orchid. Circumstances unique to individual projects or actions and their locations may still result in adverse effects to this plant. In these cases, additional or modified conservation measures may be necessary to avoid or minimize adverse effects; further consultation with the USFWS will be required. The order in which the conservation measures appear below does not imply their relative priorities.

1. Surface disturbance will be prohibited within 500 feet of surface water and/or riparian areas.

2. No Surface Occupancy will be allowed within special management areas (e.g., known threatened or endangered species habitat).

3. Portions of the authorized use area are known or suspected to be essential habitat for threatened or endangered species. Prior to conducting any onsite activities, the lessee/permittee will be required to conduct inventories or studies in accordance with Bureau and U.S. Fish and Wildlife Service guidelines to verify the presence or absence of this species. In the event that an occurrence is identified, the lessee/permittee will be required to modify operational plans to include the protection requirements of this species and its habitat (e.g., seasonal use restrictions, occupancy limitations, facility design modifications).

4. Within the potential of the ecological site (soil type, landform, climate, and geology), the Bureau will ensure that the soils are stable and allow for water infiltration to provide for optimal plant growth and minimal surface runoff.

5. The Bureau will ensure that grazing management practices will restore, maintain, or improve plant communities. Grazing management strategies consider hydrology, physical attributes, and potential for the watershed and the ecological site.

6. The Bureau will ensure that upland vegetation on each ecological site consists of plant communities appropriate to the site which are resilient, diverse, and able to recover from natural and human disturbance.

7. The Bureau will ensure that rangelands are capable of sustaining viable populations and a diversity of native plant and animal species appropriate to the habitat. Habitats that support or could support threatened species, endangered species, species of special concern, or sensitive species will be maintained or enhanced.

8. The Bureau will ensure that grazing management practices will incorporate the kinds and amounts of use that will restore, maintain, or enhance habitats to assist in the recovery of federally threatened and endangered species or the conservation of federally-listed species of concern and other State-designated special status species. Grazing management practices will maintain existing habitat or facilitate vegetation change toward desired habitats. Grazing management will consider threatened and endangered species and their habitats.

9. The Bureau will maintain biological diversity of plant and animal species; support the Wyoming Game and Fish Department strategic plan population objective levels to the extent practical and to the extent consistent with Bureau multiple use management requirements; maintain, and where possible, improve forage production and quality of rangelands, fisheries, and wildlife habitat; and to the extent possible, provide habitat for threatened and endangered and special status plant and animal species on all public lands in compliance with the Endangered Species Act and approved recovery plans.

10. In any proposed new access, wetland and riparian areas will be avoided where possible.

11. Grazing will be intensively managed within known habitat containing populations from July through September, to allow plants to bloom and go to seed.

12. Recreational site development will not be authorized in known Ute ladies'-tresses habitat.

13. The Bureau will manage stream habitats to retain, re-create, or mimic natural hydrology, water quality, and related vegetation dynamics. Projects that may alter natural hydrology or water quality, change the vegetation of the riparian ecosystem and cause direct ground disturbance will be evaluated and redesigned to ensure that adverse effects to populations of the orchid do not occur.

14. The Bureau will add the following two conservation measures to grazing permit renewals in allotments with known Ute ladies'-tresses populations.

    A. The Bureau will ensure the placement of mineral supplements, or new water sources (permanent or temporary), for livestock, wild horses, or wildlife at least 1.0 mile from known Ute ladies'-tresses populations. Supplemental feed for livestock, wildlife, or wild horses will not be authorized within 1.0 mile of known Ute ladies'-tresses populations. Straw or other feed must be certified weed-free. These restrictions are intended to keep free-ranging livestock away from Ute ladies'-tresses populations and potential overgrazing of the areas occupied by these orchids. Surveys for Ute ladies'- tresses will be conducted in potential Ute ladies'-tresses prior to livestock operations related construction projects.

   B. The Bureau will not increase permitted livestock stocking levels in any allotment with pastures containing known Ute ladies'-tresses populations without consulting with the Service.

15. Biological control of noxious plant species will be prohibited within 1.0 mile from known orchid habitat until the impact of the control agent has been fully evaluated and determined not to adversely affect the plant population. The Bureau will monitor biological control vectors.

16. Except in cases of extreme ecological health (insect or weed outbreaks/infestations), herbicide treatment of noxious plants/weeds will be well-regulated within 0.25 miles of known populations of the orchid and insecticide/pesticide treatments will be well regulated within 1.0 mile of known populations of the orchid to protect pollinators.

    Where insect or weed outbreaks have the potential to degrade area ecological health inside the buffers listed above the following will apply: where needed and only on a case-by-case basis, a pesticide use proposal or other site specific plan will address concerns of proper timing, methods of use, and chemicals. Pesticides specifics to dicots will be preferred where these are adequate to control the noxious weeds present.

    Aerial application of herbicides will be carefully planned to prevent drift in areas near known populations of the orchid (outside of the 0.25 mile buffer). The Bureau will work with the Animal and Plant Health Inspection Service (APHIS), the Service, and County Weed and Pest Agencies to select pesticides and methods of application that will most effectively manage the infestation and least affect the orchid.

17. If revegetation projects are conducted within 0.25 miles of known habitat for the orchid, only native species will be selected. This conservation measure will reduce the possibility that non-native species will be introduced and will compete with Ute ladies'- tresses orchids.

18. The Bureau will limit the use of off road vehicles (OHVs) to designated roads and trails within 0.5 mile of known Ute ladies'-tresses populations, with no exceptions for the "performance of necessary tasks" other than fire fighting and hazardous material cleanup allowed using vehicles off of highways. No OHV competitive events will be allowed within 1.0 mile of known Ute ladies'-tresses populations. Roads that have the potential to impact Ute ladies'-tresses orchids and are not required for routine operations or maintenance of developed projects, or lead to abandoned projects will be reclaimed as directed by the Bureau.

19. The Bureau will apply a condition of approval (COA) on all applications for permit to drill (APDs) oil and gas wells for sites within 0.25 miles of any known populations of the orchid. This condition will prohibit all authorized surface disturbance and OHV travel from sites containing populations of the orchid. Operations outside of the 0.25 mile buffer of orchid populations, such as "directional drilling" to reach oil or gas resources underneath the orchid's habitat, would be acceptable.

20. For known Ute ladies'-tresses populations, the Bureau will place a Controlled Surface Use (CSU) stipulation prohibiting all surface disturbances on new oil and gas leases, buffering the area within 0.25 miles of known Ute ladies'-tresses populations. For existing oil and gas leases with known Ute ladies'-tresses populations (these would be for newly discovered populations not currently documented), the Bureau will require the COA in conservation measure 19 above including the same 0.25 mile buffer area around those known Ute ladies'-tresses populations.

21. The disposal (sale and removal) of salable minerals is a discretionary Bureau action and is prohibited within a 0.25 mile buffer area of known populations of Ute ladies'-tresses orchids.

22. To prevent loss of habitat for the orchid, the Bureau “shall retain in Federal ownership all habitats essential for the survival and recovery of any listed species, including habitat that was

used historically, that has retained its potential to sustain listed species, and is deemed to be essential to their survival" (BLM 2001). Prior to any land tenure adjustments in *known* habitat for the orchid, the Bureau will survey to assess the habitat boundary and retain that area in Federal ownership. Bureau-administered public lands that contain identified habitat for the orchid will not be exchanged or sold, unless it benefits the species.

23. All proposed rights-of-way projects (powerlines, pipelines, roads, etc.) will be designed and locations selected at least 0.25 miles from any known orchid habitat to minimize disturbances. If avoidance of adverse effects is not possible, the Bureau will re-initiate consultation with the Service.

24. All proposed projects will be designed and locations selected to minimize disturbances to known Ute ladies'-tresses populations, and if the avoidance of adverse effects is not possible, the Bureau will re-initiate consultation with the Service. Projects will not be authorized closer than 0.25 miles from any known Ute ladies'-tresses populations without concurrence of the Service and the Bureau authorized officer. No ground disturbing construction activities will be authorized within 0.25 miles of any known Ute ladies'- tresses populations during the essential growing season time period (from July to September, the growing, flowering and fruiting stages) to reduce impacts to the species.

Fish

Colorado River Fishes (Endangered)

Endangered fish species evaluated in the planning area include the Colorado pikeminnow (*Ptychocheilus lucius*), humpback chub (*Gila cypha*), razorback sucker (*Xyrauchen texanus*), and bonytail (*Gila elegans*). Conservation measures are set forth by the "Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin" (Recovery Program), as signed on January 21 and 22, 1988, by the Secretary of the Interior; the governors of Wyoming, Colorado, and Utah; and the Administrator of the Western Area Power Administration. An objective of the Recovery Program was to identify reasonable and prudent alternatives that would ensure the survival and recovery of the listed species, while providing for new water development in the Upper Colorado River Basin.

Water depletions to the Colorado River watershed may jeopardize the existence of one or more federally listed threatened or endangered species and adversely modify designated critical habitats. In 1988, the USFWS developed an agreement that federal agency actions resulting in water depletions to the upper Colorado River basin greater than 100 acre-feet annually require section 7 consultation and can be offset by a one-time contribution made by the water project, which goes to Recovery Program efforts (USFWS 2001). There is no charge for existing depletions or for new depletions of less than 100 acre-feet of water. Under this agreement, as long as sufficient progress is being made toward endangered fish recovery, the USFWS will issue favorable biological opinions (BOs) on water depletions of fewer than 3,000 acre-feet of water (USFWS 2001). When reviewing projects that deplete more than 3,000 acre-feet of water per year, the USFWS determines on a case-by-case basis the recovery actions that are needed to warrant a favorable BO.

Four ESA-listed fish species, Colorado pikeminnow, humpback chub, razorback sucker, and bonytail, occurring as residents or migrants in the Colorado River watershed (inclusive of major tributaries), have experienced significant declines in abundance, distribution, and the availability of suitable habitats since the turn of the twentieth century. The primary reasons for these declines are water developments, including dam construction, diversion and consumptive use of water; changes in river flow and channel characteristics; and habitat loss and degradation.

The BLM historically has authorized several types of actions and associated infrastructure within the planning area that may result in water depletion to the Colorado River watershed. These actions include the development of livestock watering facilities, irrigation projects, wetlands, reservoirs for recreational fisheries, habitat restoration projects, fire suppression, and oil and gas development. Water depletions are considered a long-term adverse effect because implementation of management actions projected to cause water depletion is anticipated to occur over the life of the plan. Water depletion analyses assume all water used for drilling and completion of wells and evaporation from reservoirs in the Green River watershed within the planning area contribute to surface flows of the Colorado River or its tributaries.

For Colorado River watershed species analyzed in this RMP and the accompanying biological assessment (BA), the assessment area includes the portion of the planning area drained by the Green River and its tributaries, as well as areas of the Colorado River watershed downstream of the planning area.

Given the rarity of Colorado River fish species and the potential cumulative effects of water depletions from the Proposed RMP and other projects, the USFWS has expressed concern about these effects, however small, on water level in the Colorado River. Projected development of water impoundments, springs, and wells for livestock, fish, and wildlife are anticipated to deplete water in the Colorado River watershed. Table 1 summarizes the estimated average annual depletion for select actions identified for the Proposed RMP and Final EIS.

Table 1. Projected BLM Actions and Potential Water Depletions in the Colorado River Watershed During Implementation of the Kemmerer Field Office Resource Management Plan

Projected Action*	Projected Number Over 20 years	Average Annual Depletion (acre-feet)
Oil and Gas Drilling	963	96.3
Livestock Water Wells and Springs	41	0.6
Total		**96.9**

*Note: Due to the programmatic nature of RMP alternatives, key assumptions made for calculating projected water depletion in the Colorado River watershed over the life of the RMP include the following:

(1) The Green River watershed comprises 58 percent of the planning area.
(2) All Moxa Arch, CBNG wells, and 58 percent of the Overthrust Belt wells are within the Colorado River watershed.
(3) Livestock wells and springs are evenly distributed throughout the planning area.
(4) All wells and springs projected for development over the life of the RMP are constructed and completed in year 1.
(5) Water depletions associated with conventional oil and gas drilling are calculated using an average depletion of 2 acre-feet per well occurring in the Colorado River watershed by alternative. Oil and gas well numbers were derived from the RFD Scenario for Oil and Gas (BLM 2006; BLM 2008).
(6) Potential water depletion for fire management is not included in calculations due to the nonpredictive nature of unplanned fire and the negligible water depletion associated with planned fire.

CBNG	coalbed natural gas
RFD	Reasonable Foreseeable Development
RMP	Resource Management Plan

Based on the projected water depletions in Table 1, implementation of the Proposed RMP and Final EIS may affect, and is likely to adversely affect (LAA), the bonytail chub, Colorado pikeminnow, humpback chub, and razorback sucker. All other activities (listed in Section 7 below) not listed in Table 1 are not anticipated to deplete waters from the Colorado River system and will, therefore, result in a no effect (NE) determination for these endangered fish.

For actions projected to deplete water from the Colorado River watershed, the BLM will initiate formal consultation with the USFWS prior to activity approval. The BLM will continue to participate in the Cooperative Agreement for the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin (USFWS 2001).

When developing or improving water sources in the Colorado River watershed, the BLM considers development designs, such as water wells and guzzlers, rather than surface impoundments to minimize impacts to surface water hydrology.

Thus, the USFWS has determined that project depletion impacts, which the USFWS has consistently maintained, are likely to jeopardize the listed fishes, can be offset by (a) the water project proponents one-time contribution to the Recovery Program in the amount of $10.91 per acre-foot of the project‘s average annual depletion, and (b) appropriate legal protection of instream flows pursuant to state law. The USFWS believes it is essential that protection of instream flows proceed expeditiously, before significant water depletions occur.

With respect to (a) above (i.e., the depletion charge), the applicant will make a one-time payment that has been calculated by multiplying the project's annual average depletion (82 acre-feet) by the depletion charge in effect at the time payment is made. For fiscal year 1991 (October 1, 1990, to September 30, 1991), the depletion charge is $10.91 per acre-foot of the depletion, which equals a payment of $894.62 for this project. This amount will be adjusted annually for inflation on October 1 of each year based on the previous year's Composite Consumer Price Index. The USFWS will notify the applicant of any change in the depletion charge by September 1 of each year. Ten percent of the total contribution or total payment will be provided to the USFWS or its designated agent at the time of issuance of the federal approvals from the BLM. The balance will be due at the time construction commences. Fifty percent of the funds will be used for acquisition of water rights to meet the instream flow needs of the endangered fishes (unless otherwise recommended by the Implementation Committee); the balance will be used to support other recovery activities for the Colorado River endangered fishes. Payment should be made to the National Fish and Wildlife Foundation. If depletion is less than 100 acre-feet, payment is waived (Oles 2007).

Wildlife

Within the Kemmerer planning area the black-footed ferret is listed as threatened and the Canada lynx is listed as endangered under the ESA, and the yellow-billed cuckoo is a candidate for federal listing. The conservation measures for the two listed species identified in each species' respective statewide programmatic BA and BO, and for the candidate species identified in the biological evaluation (BE) are presented below.

Black-footed Ferret (Endangered)

The following conservation measures are taken from the *Final Statewide Programmatic Biological Assessment: Black-footed Ferret* (*Mustela nigripes*) (BLM 2005b) and modified as per the *Consultation for the Impacts from the Wyoming Bureau of Land Management Resource Management Plans and their Effects to the Black-footed ferret (Mustela nigripes)* (USFWS 2006).These conservation measures aim to reduce potential effects to black-footed ferrets and their habitats and highlight the steps the BLM can take to work toward recovery of the species.

The conservation measures listed below are separated into Species Conservation Measures, which affect the species directly; Habitat and Mapping Measures, which protect habitat and address prairie dog colonies and mapping activities; and Recovery/Reintroduction Measures, which address the BLM's role in and commitment to recovery of the species.

Species Conservation Measures

1. When project proposals are received for areas that still require black-footed ferret surveys and meet potential habitat criteria as defined by the USFWS guidelines, the BLM shall initiate coordination with the USFWS at the earliest possible date so that the USFWS can provide input. This should minimize the need to redesign projects at a later date to include black-footed ferret conservation measures, determined as appropriate by the USFWS.
2. In areas identified in conservation measure number one above (non-block cleared areas), if suitable prairie dog town/complex avoidance is not possible, surveys of towns/complexes for black-footed ferrets shall be conducted in accordance with USFWS guidelines and recommendations. This information shall be provided to the BLM and the USFWS in accordance with Section 7 of the Endangered Species Act, and the Interagency Cooperation Regulations.
3. Observations of black-footed ferrets, their sign, or carcasses on a project area and the location of the suspected observation, however obtained, shall be reported within 24 hours to the appropriate local BLM wildlife biologist and Field Supervisor of the USFWS office in Cheyenne, Wyoming, at (307) 772-2374. Observations should include a description including what was seen, time, date, exact location, suspected cause of death, and the observer's name and telephone number. Carcasses or other "suspected" ferret remains shall be collected by the BLM or USFWS employees and deposited with the USFWS Wyoming Field Office or USFWS law enforcement office. This type of specimen collection is authorized as described in 50 CFR 17.21(c)(3-4). It is imperative that any fresh black-footed ferret carcass be salvaged and immediately transported to the USFWS so pertinent information concerning the cause of death be gathered, including photographs in order to document an accurate depiction of the fatality
4. If black-footed ferrets or their sign are found on public lands outside of the Non-essential Experimental population areas in Wyoming, all previously authorized project-related activities (or actions on any future application that may directly, indirectly, or cumulatively affect the colony/complex) ongoing in the complex in which black-footed ferrets are found shall temporarily cease until further direction is developed by a task force consisting of the Bureau Field Office Manager, the USFWS Field Office Supervisor, the WGFD Non-game Coordinator, and other potentially affected parties. This task force will be formed within 48 hours of the find to determine appropriate conservation/protection actions. The Bureau shall coordinate with these affected parties to ensure that ferret surveys or appropriate actions are conducted as deemed necessary. The Bureau will reinitiate Section 7 consultation with the USFWS. An emergency road closure limiting access to the site will be enacted by the BLM within 48 hours of the find to protect newly discovered black-footed ferrets. This emergency road closure would be for all non-paved roads within at least 1 mile of the find. On a case-by-case basis and with approval of the USFWS, certain surface disturbing activities within the town or complex may be allowed to continue.
5. Information on ferret identification will be provided and posted in common areas and circulated in a memorandum among all employees and service providers. This information shall illustrate the black-footed ferret and its sign; describe morphology, tracks, scat, skull, habitat characteristics, behavior, and current status; and explain the relationship between project development and impacts to black-footed ferrets, especially regarding canine distemper and recreational shooting.
6. Discovery of a live black-footed ferret outside the Non-essential Experimental population areas in Wyoming would have profound importance to the species' recovery. Reporting of such a

discovery by staff, contractors, permittees, etc., will be fully encouraged by BLM staff and management.

Habitat and Mapping Measures

1. New prairie dog towns can be allowed to become established on public lands in all circumstances where they would not interfere with other previously established activities.

Recovery/Reintroduction Measures

The BLM shall work with the USFWS and the WGFD to identify and establish Management Areas (MAs) for potential reintroduction sites for black-footed ferrets. These areas will be selected based on a number of factors, including BLM's ability to protect and manage them, their size (optimally 5,000 to 10,000 acre sites), and potential utility to black-footed ferrets. Because of the need to manage reintroduction sites (of prairie dog complexes) on a landscape scale, and because plague is a significant but unpredictable event, MAs may be selected that are currently "plagued out," but may recover in time. Complexes can be selected from, but not necessarily restricted to, those shown in Map 3. Protective measures shall be drawn up for these MAs, and may include being withdrawn from leasing and protected from commercial development (i.e., land disposal through Recreation and Public Purpose Act actions, etc.). Examples of protective measures that will be included in these MAs are:

- The BLM shall work with respective WGFD agencies and the USFWS, offices to ensure that enough reintroduction sites are maintained to successfully recover the black-footed ferret. If areas available for reintroduction are removed through BLM's authorized actions below a threshold level, so the black-footed ferret can no longer be recovered, then those actions reducing availability of reintroduction sites will be modified or discontinued until the black-footed ferret has been recovered.
- The BLM shall monitor and post restrictions, if necessary, on recreational opportunities and other uses on BLM-administered lands within 1 mile of formally proposed and active reintroduction sites for black-footed ferrets.
- The BLM and operators shall conduct educational outreach to employees regarding the nature, hosts, and symptoms of canine distemper and its effects on black-footed ferrets, focusing attention on why employees should not have pets on worksites during or after hours. The BLM shall encourage operators to develop policies to prohibit dogs from operation sites or require current distemper vaccinations within black-footed ferret reintroduction areas. It is recommended that vaccinated puppies not be allowed into the black-footed ferret reintroduction areas until 1 month after their final distemper vaccination due to potential effects of the modified live virus vaccine.

Canada Lynx (Threatened)

The following conservation measures are taken directly from the *Final Statewide Programmatic Biological Assessment: Canada Lynx* (*Lynx canadensis*) (BLM 2005c) and reiterated in the *Consultation for the Impacts from the Wyoming Bureau of Land Management's Resource Management Plans to the Canada Lynx (Lynx canadensis)* (USFWS 2005). These conservation measures are intended to conserve the lynx and to reduce or eliminate adverse effects from the spectrum of management activities on BLM land. These measures are provided to outline opportunities to benefit the lynx and to help avoid negative impacts through thoughtful planning of activities.

These conservation measures are binding measures that the BLM shall implement to facilitate conservation of lynx. Lynx analysis units (LAUs) typically encompass lynx habitats (may or may not be currently in suitable condition for denning or foraging habitat) and other areas (such as lakes, low elevation ponderosa pine forest, and alpine tundra). The conservation measures listed below generally apply only to lynx habitats within the LAUs; however, their use in areas of lynx habitats or potential lynx habitats not fitting the criteria of an LAU is encouraged.

On February 28, 2008, the USFWS proposed to revise designated critical habitat for the contiguous United States distinct population segment of the Canada lynx under the ESA (73 FR 10860). Approximately 27.3 million acres fall within the boundaries of the proposed revised critical habitat designation. Only a small portion (596 acres), fall within the Kemmerer BLM RMP planning area. With so few acres proposed for designation in the Kemmerer planning area, the BLM has determined that any action undertaken in the Kemmerer planning area on these acres will have negligible effect to the proposed critical habitat as a whole, and will not lead to adverse modification of the designated critical habitat. In the event that the USFWS includes portions of Kemmerer BLM-administered lands in the final critical habitat designation, the BLM will evaluate potential effects to that habitat and conduct Section 7 consultation with the USFWS as appropriate.

Because it is impossible to provide measures that will address all possible actions in all locations across the broad range of the lynx, it is imperative that project-specific analysis and design be completed for all actions that could affect lynx. Circumstances unique to individual projects or actions and their locations may still result in adverse effects on lynx. In these cases, additional or modified conservation measures may be necessary to avoid or minimize adverse effects.

All Programs

1. Within an LAU, the BLM shall ensure that mapping occurs of lynx habitats and nonhabitats, as well as their denning habitats, foraging habitats, and topographic features important for lynx movement. The BLM or project proponent shall identify whether all lynx habitats within an LAU are in suitable or unsuitable conditions. This will involve interagency coordination when LAUs cross administrative boundaries.
2. The BLM shall limit disturbance within each LAU to 30 percent of the suitable habitats within the LAU. If 30 percent of the habitats within an LAU are currently in unsuitable conditions, no further reduction of suitable conditions shall occur as a result of management activities. The BLM shall map oil and gas production and transmission facilities, mining activities and facilities, dams, forest management, and agricultural lands on public lands and evaluate projects on adjacent private lands to assess cumulative effects. This will involve interagency coordination when LAUs cross administrative boundaries, primarily with the U.S. Forest Service (USFS).
3. BLM management actions shall not change more than 15 percent of lynx habitats within an LAU to an unsuitable condition within a 10-year period. This will involve interagency coordination where LAUs cross administrative boundaries.
4. The BLM shall maintain denning habitats in patches generally larger than 5 acres, comprising at least 10 percent of lynx habitats. When less than 10 percent is currently present within an LAU, management actions that would delay development of denning habitat structures shall be deferred. This will involve interagency coordination when LAUs cross administrative boundaries.
5. The BLM, using best available science, shall ensure that key linkage areas that may be important in providing landscape connectivity within and between geographic areas across all ownerships are identified.
6. The BLM shall ensure that habitat connectivity within and between LAUs is maintained.
7. The BLM shall document lynx observations (tracks, sightings, as well as date, location, and habitat) and provide these to the Wyoming Natural Diversity Database (WYNDD). The BLM

also shall request an annual update from the WYNDD on all sightings for review in each field office.

Forest Management

1. Following a disturbance (blowdown, fire, insects) that could impact lynx denning habitats, the BLM shall allow no salvage harvest when the affected area is smaller than 5 acres. Some exceptions apply, as specified in the LCAS timber management project planning standards.
2. The BLM shall allow precommercial thinning only when stands no longer provide snowshoe hare habitats.
3. In aspen stands, the BLM shall ensure the application of harvest prescriptions that favor regeneration of aspen.
4. The BLM shall ensure that improvement harvests (commercial thinning, selection, etc.) are designed to retain and improve recruitment of an understory of small diameter conifers and shrubs preferred by hares.

Fire Management

1. In the event of a large wildfire, the BLM shall ensure that a post-disturbance assessment prior to salvage harvest be conducted, particularly for stands that was formerly in late successional stages, to evaluate the potential for lynx denning and foraging habitats.
2. The BLM shall ensure that construction of temporary roads and fire lines are minimized to the extent possible during fire-suppression activities, and shall ensure revegetation of roads and firelines that are necessary. Construction on ridges and saddles should be avoided, if possible.

Recreation

1. The BLM shall allow no net increase in groomed or designated over-snow routes and snowmobile play areas in LAUs unless the designation serves to consolidate unregulated use and improves lynx habitats through a net reduction of compacted snow areas. This is intended to apply to dispersed recreation rather than existing ski areas. Winter logging activity is not subject to this restriction.
2. In lynx habitats within an LAU, the BLM shall ensure that federal actions do not degrade or compromise landscape connectivity or linkage areas when planning and operating new or expanded recreation developments.
3. The BLM shall ensure that trails, roads, and lift termini are designed to direct winter activities away from diurnal security habitats.
4. To protect the integrity of lynx habitats, the BLM shall ensure that (as new information becomes available) winter recreational special use permits (outside of permitted ski areas) that promote snow-compacting activities in lynx habitats are evaluated and amended, as needed.

Livestock Grazing

1. The BLM shall ensure that livestock use in openings created by fire or forest management that would delay successful regeneration of the shrub and tree components is not allowed. This regeneration may take 3 years or longer and will depend on site-specific conditions.
2. The BLM shall ensure that grazing in aspen stands is managed to ensure sprouting and sprout survival sufficient to perpetuate the long-term viability of the clones.

3. Within lynx habitats, the BLM shall ensure that livestock grazing in riparian areas and willow patches is managed to maintain or achieve mid seral or higher conditions to provide cover and forage for prey species.
4. On projects where over-snow access is required, the BLM shall ensure use is restricted to designated routes.
5. Predator control activities, including trapping or poisoning on domestic livestock allotments on federal lands within lynx habitat, shall be conducted by Wildlife Services personnel in accordance with USFWS recommendations established through a formal Section 7 consultation process.
6. The BLM shall ensure that the potential importance of shrub-steppe habitats in the lynx habitat matrix and in providing landscape connectivity between blocks of lynx habitats is evaluated and considered as integral to overall lynx habitats, where appropriate. Livestock grazing within shrub-steppe habitats in such areas should be managed to maintain or achieve mid seral or higher conditions to maximize cover and prey availability. Such areas currently in late seral conditions should not be degraded.
7. In high-elevation riparian areas, especially those subject to grazing, the BLM shall ensure that weed assessments and weed control are conducted to optimize habitat for snowshoe hares.

Access

1. Within lynx habitats, the BLM shall ensure, using best available science, that key linkage areas and potential highway crossing areas are identified.
2. The BLM shall work cooperatively and proactively with the Federal Highway Administration and State Departments of Transportation to identify land corridors necessary to maintain connectivity of lynx habitats and map the location of "key linkage areas" where highway crossings may be needed to provide habitat connectivity and reduce mortality of lynx (and other wildlife).
3. Dirt and gravel roads traversing lynx habitats (particularly those that could become highways) should not be paved or otherwise upgraded (e.g., straightening of curves, widening of roadway, etc.) in a manner that is likely to lead to substantial increases in traffic volumes, traffic speeds, increased width of the cleared ROW, or would foreseeably contribute to development or increases in human activity in lynx habitats. Whenever rural dirt and gravel roads traversing lynx habitat are proposed for such upgrades, a thorough analysis should be conducted on the potential direct and indirect effects to lynx and lynx habitat.

Lands Management

1. The BLM shall ensure that proposed land exchanges, land sales, and special use permits are evaluated for effects on lynx habitats and key linkage areas.

Energy Development

1. If activities are proposed in lynx habitats, the BLM shall ensure that stipulations and conditions of approval for limitations on the timing of activities and surface use and occupancy are developed at the leasing and notice of staking/APD stages. For example, the BLM would require that activities not be conducted at night, when lynx are active, and avoid activity near denning habitats during the breeding season (April or May to July) to protect vulnerable kittens.
2. The BLM shall ensure that snow compaction is minimized when authorizing and monitoring developments, as well as encourage remote monitoring of sites located in lynx habitats so that they do not have to be visited daily.

Yellow-billed Cuckoo (Candidate)

The following conservation measures are taken directly from the *Final Programmatic Biological Evaluation for the Western Yellow-billed Cuckoo (Coccyzus americanus)* in Wyoming (BLM 2003).

Riparian Area Management

1. Consider carefully the affects to the yellow-billed cuckoo from any activities within or adjacent to cuckoo habitats.
2. Apply a 500-foot buffer through seasonal restriction to include the breeding season from May 15 through August 15 and apply rehabilitation standards in or adjacent to yellow-billed cuckoo habitat, when necessary.
3. Manage for a stable or increasing population of cottonwood/willow vegetation in yellow-billed cuckoo habitats. Ensure that all age classes are present (seedling, young, mature, and decadent), with more seedlings present than decadent plants, and more young plants than mature ones.
4. When planting trees, select only native species and avoid Russian olive and tamarisk (salt cedar).

Livestock Grazing Management

1. Use livestock management practices that minimize impacts to important cuckoo habitats. Examples of practices include planned grazing systems, riparian pasture fences, exclosures, herding, changes in class of livestock, timing and season of use, seasonal changes, managing use levels, off-site water and salting, resting for 1 or more years, and reduction in livestock numbers.
2. Improve livestock distribution and forage use by using salt and mineral blocks, but avoid placing them within riparian areas (keep them at least ¼ mile from streams) or in immediately adjacent uplands.
3. Locate livestock-handling facilities and collection points outside riparian areas. Branding, loading, and other handling efforts should be limited to areas and times that do not harm soils and plants in riparian zones.

General Construction Activities

1. Where roads, pipelines, and powerlines must be routed through riparian habitats, the construction work should not be accomplished from mid May to mid August, when the cuckoos are nesting.
2. Topography should be returned to its original condition to the greatest extent possible to ensure the hydrology remains intact.
3. Combine multiple roads and ROW to one stream-crossing site.
4. Maintain at least 100-foot buffer zones between riparian areas and mining, oil, gas, sand/gravel, and geothermal activities, including structures, roads, and support facilities.

Developed Recreation Areas

1. Boat and raft landing areas should not be developed in yellow-billed cuckoo habitats. (Discussed at April 18-19, 2003, Yellow-billed Cuckoo meeting in Rock Springs, Wyoming).
2. Outfitting camps should not be permitted in yellow-billed cuckoo habitat. (Discussed at April 18-19, 2003, Yellow-billed Cuckoo meeting in Rock Springs, Wyoming).

Pesticide Use

1. Restrict the use of foggers for insect control in yellow-billed cuckoo habitats, especially during the nesting season, so a food source remains available for birds.

2. Chemical insecticides should not be utilized within 500 feet of occupied yellow-billed cuckoo habitats, and chemical herbicides, which do not break down upon contact with soil or water, should be prohibited within 500 feet of riparian areas. Supposedly the use of Demolin to control grasshopper outbreaks does not move through ecological systems. The chemical is an agent that affects only the ability of young grasshoppers to develop an exoskeleton. It is applied only when a potential outbreak is identified and application would not reduce grasshopper numbers to lower than those during a non-outbreak year. Demolin does not affect insects, which do not have exoskeletons. BLM state weed coordinator, Ken Henke, recommends the following as a conservation measure: "Chemical insecticides should not be utilized in occupied cuckoo habitat. In case of a grasshopper outbreak, insecticides other than Demolin should not be utilized within yellow-billed cuckoo habitat. A quarter-mile buffer zone around active nests could be applied."
3. Chemical insecticides or herbicides, if used, should be applied by hand in yellow-billed cuckoo habitats and only in cases where insect invasion or noxious weed outbreak has the potential to degrade area ecological health.
4. In areas adjacent to yellow-billed cuckoo habitats, carefully plan aerial application of herbicides to prevent drift of chemicals into riparian areas

Prescribed Burning

1. Prescribed fire activities will be used only to maintain or enhance yellow-billed cuckoo habitats. Restrictions, such as for smoke dispersal heat intensity, buffer zones, or timing etc., will be incorporated into the fire plan and approved by a BLM biologist prior to conducting the burn. (Developed at April 18-19, 2003, Yellow-billed Cuckoo meeting in Rock Springs, Wyoming).

Wildlife Management

1. Maintain beaver populations where they occur in yellow-billed cuckoo habitats and encourage reintroduction into areas historically occupied by beavers in yellow-billed cuckoo habitats. (Discussed, along with BMPs, at April 18-19, 2003, Yellow-billed Cuckoo meeting in Rock Springs, Wyoming).

CONSERVATION AGREEMENTS

Wildlife

Conservation agreements for the two listed and one candidate wildlife species that may be potentially present within the planning area (black-footed ferret, Canada lynx, and yellow-billed cuckoo) are identified in each species' respective statewide BA, BO, or BE. In addition, the Kemmerer Field Office adheres to the *Final Report and Recommendations from the Wyoming State-wide Bighorn/Domestic Sheep Interaction Working Group* (Wyoming State-wide Bighorn/Domestic Sheep Interaction Working Group 2004), for conservation of bighorn sheep. To strengthen the cooperative approach to the management of wildlife and wildlife habitat on public land at all levels of the respective agencies, the BLM and the Wyoming Game and Fish Department entered into the *Umbrella Memorandum of Understanding Between Wyoming Game and Fish Department and U.S. Department of the Interior Bureau of Land Management (Wyoming) For Management of the Fish and Wildlife Resources on the Public Lands* (WGFD and BLM 1990). Interested individuals can find the latest recommendations for conservation as well as any agreements or management strategies for BLM sensitive species on the Wildlife Management Program page of the BLM Wyoming website at http://www.blm.gov/wy/st/en/programs/Wildlife.html.

BLM-ENDORSED MANAGEMENT STRATEGIES

BLM-endorsed management strategies are governed by applicable laws, policies, and other requirements. Often, BLM-endorsed management strategies reflect BMPs as outlined in each species' respective BA, BO or BE. Interested individuals can find the latest recommendations for conservation as well as any agreements or management strategies for BLM sensitive species on the Wildlife Management Program page of the BLM Wyoming website at http://www.blm.gov/wy/st/en/programs/Wildlife.html.

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KEMMERER
PROPOSED RESOURCE MANAGEMENT PLAN AND
FINAL ENVIRONMENTAL IMPACT STATEMENT

Appendix B

Priority Use and Management of Forage Reserve Areas

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Forage Reserve Allotments

Program Criteria

The program would require voluntary relinquishment of grazing privileges to accommodate the specific use. Permittee/lessee use of forage reserve allotments will be voluntary. There are no exceptions to the voluntary provisions in this program.

Priority Criteria for Use of Forage Reserve Area

1. For deferment of prescribed burns conducted in accordance with approved allotment management plans
2. For temporary deferment of critical riparian areas in allotments where an approved management plan is in place
3. On allotments subject to wildfire
4. On allotments subject to insect infestation
5. To any Kemmerer Field Office permittee/lessee.

When one or more – allocate to

1. Operator making the highest contribution to the allotment being deferred
2. Operator who has not used the forage reserve most recently.

Forage reserve allotment offered 3 years out of 4.

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PROPOSED RESOURCE MANAGEMENT PLAN AND
FINAL ENVIRONMENTAL IMPACT STATEMENT

Appendix C

Public Involvement, Consultation, and Coordination

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Public Involvement, Consultation, and Coordination

Public involvement, consultation, and coordination occurred prior to and throughout preparation of the Kemmerer Resource Management Plan (RMP) revision and associated Environmental Impact Statement (EIS). This appendix describes the public involvement process, as well as other key consultation and coordination activities undertaken to prepare the EIS in support of the RMP revision.

The Bureau of Land Management (BLM) decisionmaking process is conducted in accordance with the requirements of the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations implementing NEPA, and the U.S. Department of the Interior (USDI) and BLM policies and procedures implementing NEPA. NEPA and the associated regulatory and policy framework require that all federal agencies involve the interested public in their decisionmaking, consider reasonable alternatives to proposed actions, and prepare environmental documents that disclose the potential impacts of proposed actions and alternatives.

The BLM accomplished public involvement, consultation, and coordination through public meetings, informal meetings, individual contacts, news releases, newsletters, workshops, a planning website, and the *Federal Register*. A Notice of Intent (NOI) published in the *Federal Register* on June 16, 2003, formally announced that the BLM Kemmerer Field Office was preparing an RMP and associated EIS. Publication of the NOI initiated the scoping process and invited participation of affected and interested agencies, organizations, and members of the public in determining the scope and issues to be addressed by alternatives and analyzed in the EIS. The BLM solicited additional public involvement to help identify issues to be addressed in developing a full range of land management alternatives (see Public Involvement Section below).

PUBLIC INVOLVEMENT

In accordance with CEQ scoping guidance, the BLM provided avenues for public involvement as an integral part of revising the RMP and preparing the Final EIS. CEQ scoping guidance defines scoping as the "process by which lead agencies solicit input from the public and interested agencies on the nature and extent of issues and impacts to be addressed and the methods by which they will be evaluated" (CEQ 1981). The scoping report, which summarizes issues identified during the scoping process, is available on the Kemmerer RMP website at www.blm.gov/rmp/kemmerer/.

The intent of the scoping process is to provide an opportunity for the public, tribes, other government agencies, and interest groups to scope the planning process and to identify planning issues to be addressed by alternatives or analyzed in the EIS. In general, public involvement assists the agencies through the following.

- Broadening the information base for decisionmaking
- Informing the public about the EIS and proposed RMP and the potential impacts associated with various management decisions
- Ensuring public needs and viewpoints are brought to the attention of the agency

Scoping Period

Publication of the NOI on June 16, 2003, announced the BLM's intention to revise the Kemmerer RMP and prepare a Draft EIS. Scoping for the RMP revision and Draft EIS took place from June 16, 2003, to

November 26, 2003. BLM resource management regulations require a 30-day scoping period; however, the Kemmerer revision scoping period remained open for 5 months.

The BLM utilized the public scoping process to identify planning issues to direct (drive) the formulation of alternatives and to frame the scope of analysis in the EIS. The scoping process also was used to introduce the public to preliminary planning criteria, which set limits to the scope of the RMP revision. Fifty-four comment letters were received during the scoping period. The scoping report provides a general summary of the issues found in these letters.

Scoping Notice

The BLM prepared a public scoping notice and mailed the notice to 779 federal, state, and local agencies, interest groups, and members of the public on October 27, 2003. In the scoping notice, the BLM solicited written comments on the RMP revision process, issues, and impacts and invited the public to a series of three public scoping meetings held throughout the planning area. The scoping notice served to remind the public of the opportunity to view the Summary of the Management Situation Analysis (MSA), the project schedule, and other relevant project information on the Kemmerer RMP website. In addition, the scoping notice provided general information on the planning area, background information on the planning process, and dates and locations scheduled for the public scoping meetings.

Scoping Meetings

Public scoping meetings were held in Kemmerer, Evanston, and Rock Springs, Wyoming, on November 17, 18, and 19, 2003, respectively (Table C-1). The BLM structured the meetings in an open-house format, with two formal presentations made by the Kemmerer Field Office Assistant Manager for Resources. Resource specialists and other representatives of the BLM were on hand to personally address questions and provide information to meeting participants. The BLM provided four fact sheets, a summary of the MSA, and a series of four display boards at each scoping meeting. The BLM encouraged attendees to comment using a variety of media, including written comment forms, flip charts, planning area maps, and a computer kiosk.

Table C-1. Public Involvement, Coordination, and Consultation Meetings

Date	Location	Type of Meeting
November 17, 2003	Kemmerer, Wyoming	Public Scoping Meeting
November 18, 2003	Evanston, Wyoming	Public Scoping Meeting
November 19, 2003	Rock Springs, Wyoming	Public Scoping Meeting
August 6, 2007	Cokeville, Wyoming	Open House
August 7, 2007	Kemmerer, Wyoming	Public Meeting
August 8, 2007	Rock Springs, Wyoming	Public Meeting
August 9, 2007	Evanston, Wyoming	Public Meeting
August 10, 2007	Lyman, Wyoming	Open House

Public Meetings/Open Houses

Two open houses and three public meetings were held during the 90-day public comment period for the Draft RMP and EIS in Cokeville, Kemmerer, Rock Springs, Evanston, and Lyman, Wyoming (Table C-1). Similar to the public scoping meetings, resource specialists and other representatives of the BLM were on hand to personally address questions and provide information to meeting participants. The BLM provided four fact sheets and a series of four display boards at each public meeting describing the RMP revision process, key planning issues, formulation of alternatives, and how to provide effective comments. The BLM encouraged attendees to comment using a variety of media including written comment forms, planning area maps, and a computer kiosk. A court reporter was also available to record verbal comments and the testimony of all attendees taking part in the public testimony portion of the meeting.

Opportunities to Comment

The BLM provided a variety of avenues through which the public could comment during the scoping period and the 90-day comment period. These avenues are listed below.

- **Mail** – The NOI and the scoping notice invited interested parties to submit comments by mail to the Kemmerer Field Office.
- **E-mail** – The NOI provided the following e-mail address for submitting comments electronically: krmpwymail@blm.gov.
- **Online** – The Kemmerer RMP revision website at www.blm.gov/rmp/kemmerer/ was launched on November 3, 2003. The website provides history about the project, a project schedule, a document library, a mailing-list screen, and a comment screen. During the comment period, the public could enter their comments on the website and submit them electronically. The capability to submit comments via the website continued through the 90-day comment period for the Draft EIS.
- **Telephone** – The scoping notice and all four fact sheets provided a phone number so interested parties could call and submit leave oral comments.
- **In Person at Meetings** – The BLM provided the public the opportunity to comment at all three scoping meetings, two open houses, and three public meetings. Comment methods included a computer kiosk, through which interested individuals could type their comments; paper comment forms that could be filled out and submitted at the meetings or mailed in at a later date; and flip charts and planning area maps upon which comments could be written to share with the BLM and with other members of the public.

Mailing List

The project mailing list for the public scoping process was initially developed from the Kemmerer Field Office mailing list, but was updated throughout the planning process. The BLM encouraged scoping meeting participants to add their names to the mailing list. Some individuals added their names and addresses to the project mailing list by registering on the project website, as well as through personally contacting the BLM. Currently, the Kemmerer Field Office mailing list includes 916 addresses.

Newsletters

Periodic newsletters have been and are being developed and distributed to keep the public informed of the Kemmerer RMP revision process. The January 2004 newsletter provided basic background information on the project, including the purpose and need for updating the RMP and issues that the plan may address. The newsletter also extended an invitation to the public to be involved in the process, advertised the Kemmerer RMP revision website, and summarized public scoping comments.

A second newsletter (summer 2006) described the development of the alternatives, the process of selecting a preferred alternative, announced the schedule of the Draft EIS, and offered avenues for public involvement. A third newsletter was distributed in June 2007, prior to the release of the Draft EIS, to announce the publication of the Draft EIS, and to provide details on how to provide comments.

Website

The Kemmerer RMP revision website is located at www.blm.gov/rmp/kemmerer/. The site serves as a virtual repository for documents related to the development of the RMP revision, including announcements, bulletins, and documents. These documents are available in PDF format to ensure that they are available to the widest range of interested parties. The website gives the public the opportunity to submit their comments for consideration as part of the planning process. The website also offers the public an opportunity to be added to the project mailing list.

Future Public Involvement

Public participation is ongoing throughout the planning process. The Final EIS considered all substantive oral and written comments received during the 90-day public comment period for the Draft EIS. Members of the public with standing will have the opportunity to protest the content of the Proposed RMP and Final EIS during the specified 30-day protest period. The ROD will be issued by the BLM after the release of the Final EIS, the Governor's Consistency Review, and protest resolution.

CONSULTATION AND COORDINATION

This section documents the consultation and coordination efforts undertaken by the BLM throughout the process of revising the RMP and developing the EIS. Title II, Section 202, of the Federal Land Policy and Management Act (FLPMA) directs the BLM to coordinate planning efforts with Native American tribes, other federal departments, and agencies of the state and local governments as part of its land use planning process. The BLM is directed to integrate NEPA requirements with other environmental review and consultation requirements to reduce paperwork and delays (40 Code of Federal Regulations 1500.4-5). The BLM accomplished coordination with other agencies and consistency with other plans through ongoing communications, meetings, and collaborative efforts with the Interdisciplinary Team, which includes BLM specialists and federal, state, and local agencies.

Cooperating Agencies

The Kemmerer Field Office extended cooperating agency status to the State of Wyoming, Lincoln County, Uinta County, Sweetwater County, U.S. Bureau of Reclamation various conservation districts, and tribal governments. The BLM invited these entities to participate because they have jurisdiction by law or because they could offer special expertise. A list of the cooperating agencies that have actively participated in cooperators' meetings leading up to the development of the RMP revision and EIS include the following:

Local Governments

- Lincoln County Commissioners
- Lincoln Conservation District
- Uinta County Commissioners
- Uinta County Conservation District
- Sweetwater County Commissioners
- Sweetwater County Conservation District

State of Wyoming

- State Historic Preservation Office
- Department of Agriculture
- Department of Environmental Quality

- Game and Fish Department
- Office of State Lands and Investments
- State Planning Coordinator's Office

Federal Government

- Bureau of Reclamation

BLM formally invited the cooperating agencies to participate in developing the alternatives and to provide existing data and other information relative to their agency responsibilities, goals, mandates, and expertise. Cooperating agencies provided input during the initial scoping process on issues of special expertise or legal jurisdiction. In addition, cooperating agencies participated in a series of alternative formulation workshops, reviewed draft information and documents, and met with BLM management and resource specialists periodically throughout the revision process to discuss planning issues and provide input to the process. Table C-2 lists these meetings and workshops.

Table C-2. Meetings with Cooperating Agencies

Date	Location	Type of Meeting
January 28, 2004	Kemmerer, Wyoming	Meeting with Shoshone-Bannock Tribes for an Overview of the RMP Process
February 2-6, 2004	Kemmerer, Wyoming	Workshop #1: Alternative Development (All Cooperating Agencies)
February 23-27, 2004	Kemmerer, Wyoming	Workshop #2: Alternative Formulation (All Cooperating Agencies)
April 12, 2004	Kemmerer, Wyoming	Meeting with Shoshone-Bannock Tribes Technical Staff and Business Council
June 29-30, 2004	Kemmerer, Wyoming	Field Manager's Meeting with Shoshone-Bannock and Eastern Shoshone Tribes
December 13-15, 2004	Kemmerer, Wyoming	Workshop #3: Cooperators' Input for the Preferred Alternative (All Cooperating Agencies)
April 20-21, 2005	Kemmerer, Wyoming	Field Manager's Open House Meeting with Cooperators
May 11, 2005	Kemmerer, Wyoming	Cooperating Agency Work Session
September 14-15, 2005	Kemmerer, Wyoming	Workshop #4: Preferred Alternative Formulation (All Cooperating Agencies)
September 26-30, 2005	Kemmerer, Wyoming	Cooperating Agency Work Session
October 31 - November 2, 2006	Kemmerer, Wyoming	Review of comments on Preliminary Draft RMP/EIS Version 1

Section 7 Consultation

The Kemmerer Field Office contacted the U.S. Fish and Wildlife Service (USFWS) regarding Section 7 of the Endangered Species Act. The BLM sent a letter to the USFWS concerning the Section 7 consultations, presenting the method and approach of how consultation would be conducted and providing details on the process of Programmatic Species-Specific Section 7 Consultations on Wyoming

BLM RMPs. The USFWS provided the following lists as a general reference for the Kemmerer Field Office when evaluating BLM Section 7 responsibilities:

- List of Endangered, Threatened, and Candidate species for the Bureau of Land Management, Kemmerer Field Office, dated March 17, 2004.
- Endangered, Threatened, Proposed and Candidate Species, and Designated Critical Habitat in Wyoming State, dated March 23, 2004.

Consultation letters between the USFWS and the Kemmerer Field Office are located at the end of this appendix. The Kemmerer Field Office will continue consulting with the USFWS through completion of the final biological assessment and final RMP.

Native American Interests

Consultation with Native American tribes is part of the NEPA scoping process and a requirement of FLPMA. The Kemmerer Field Office took multiple steps to contact the tribes and include them in the scoping process. On September 12, 2003, the BLM sent letters to the following tribes inviting them to be a part of the planning process through consultation and public scoping meetings, as well as requesting information to be considered in the planning process:

- Eastern Shoshone Tribes
- Northern Arapaho Tribes
- Northern Ute Tribes
- Shoshone-Bannock Tribes.

Following the scoping process, the BLM sent a letter to each of the above-listed tribes on November 21, 2003, requesting specific information to identify areas of special concern for the tribes. The letter also offered the opportunity for meetings or field trips between representatives from the tribes and the Kemmerer Field Office. Representatives from the Kemmerer Field Office followed up on these letters with telephone calls to each tribe. In the letters and during the follow-up telephone calls, the BLM stressed the need for the tribes to review and comment on the Draft EIS.

Representatives of the Kemmerer Field Office met with members of the Shoshone-Bannock tribes several times to solicit input from the tribes concerning the RMP revision. A meeting with Shoshone-Bannock Technical Staff on January 28, 2004, included the BLM giving an overview of the RMP process, a description of land use planning procedures, and a PowerPoint presentation outlining some of the major issues that will be addressed in the RMP. A similar meeting was held on April 12, 2004; however, on this occasion, the BLM presentation was given before a larger group of representatives from the Shoshone-Bannock tribe, representing several technical staff departments and including four of the seven Business Council members. Members of the Shoshone-Bannock and Eastern Shoshone tribes met with representatives from the Kemmerer Field Office on June 29 and 30, 2004, to discuss the RMP revision. The tribes received maps of the general locations of cultural and spiritual interest to the tribes, as well as a tour of the planning area. Native American consultation letters can be found at the end of this appendix.

DISTRIBUTION LIST

Local and regional media outlets (radio stations, newspapers, and television stations) received notification of the release of the Proposed RMP and Final EIS. A copy of the Proposed RMP and Final EIS was provided to the following governments, individuals, and institutions:

Tribal Governments

- Eastern Shoshone Tribes
- Northern Arapaho Tribes
- Northern Ute Tribes
- Shoshone-Bannock Tribes

Local Governments (Counties, Cities, Towns)

Lincoln County, Wyoming

- Lincoln County Commissioners
- Lincoln Conservation District

Uinta County, Wyoming

- Uinta County Commissioners
- Uinta County Conservation District

Sweetwater County, Wyoming

- Sweetwater County Commissioners
- Sweetwater County Conservation District

State of Wyoming

- Senator Rae Lynn Job, Sweetwater/Fremont
- Senator John M. Hastert, Sweetwater
- Senator Stan Cooper, Lincoln/Sublette/Sweetwater/Uinta
- Senator Ken Decaria, Sweetwater
- Representative Bernadine Craft, Sweetwater
- Representative Allen Jaggi, Uinta/Sweetwater
- Representative Owen Petersen, Uinta
- Representative Kathy Davison, Lincoln/Sublette/Sweetwater
- Representative Dan Dockstader, Lincoln
- Representative Stan Blake, Sweetwater
- Representative Marty Martin, SW Fremont/Sweetwater
- Representative Saundra Meyer, Uinta
- Representative Bill Thompson, Sweetwater

Wyoming State Agencies

- Historic Preservation Office
- Department of Agriculture
- Department of Environmental Quality
- Game and Fish Department
- State Geological Survey
- Office of State Lands and Investments
- Planning Coordinator's Office

Wyoming State Boards/Commissions

- Air Quality Advisory Board
- Board of Wildlife Commissioners
- Natural Gas Pipeline Authority
- Agriculture Board
- Environmental Quality Council
- Farm Bureau Federation
- Land Quality Advisory Board
- Livestock Board
- Mining Council
- Oil and Gas Conservation Commission
- Recreation Commission
- State Board of Outfitters and Professional Guides
- State Grazing Board
- Trails Advisory Council

Associations/Councils

- Coalbed Methane Coordination Coalition
- Mormon Trails Association
- Oregon-California Trails Association
- Petroleum Association of Wyoming
- Powder River Basin Resource Council
- Wildlife Habitat Council
- Wyoming Association of Municipalities
- Wyoming County Commissioners Association
- Wyoming Mining Association
- Wyoming Natural Diversity Database
- Wyoming Outdoor Council
- Wyoming Sportsmen's Association
- Wyoming Stockgrowers Association
- Wyoming Wilderness Association
- Wyoming Woolgrowers Association
- Independent Petroleum Association of Mountain States

Clubs/Alliances/Societies/Groups

- American Lands Alliance
- Animal Protection Institute of America
- Audubon Society
- Audubon Wyoming
- Biodiversity Conservation Alliance
- Defenders of Wildlife
- Earthjustice
- Environmental Defense
- Foundation for North American Wild Sheep
- Friends of Fort Bridger
- Humane Society of the United States
- Jackson Hole Conservation Alliance
- Medicine Butte Wildlife Association
- Natural Resources Defense Council
- National Trust for Historic Preservation
- National Wildlife Federation
- People for the USA
- People for Wyoming
- Rocky Mountain Elk Foundation
- Sierra Club (Northern Plains and Wyoming Chapters)
- Southwest Wyoming Dirt Riders
- Southwest Wyoming Industrial Association
- Southwest Wyoming Mineral Association
- Sportsmen for Fish and Wildlife – Star Valley
- Sweetwater Wildlife Association
- The Fund for Animals
- The Land and Water Fund of the Rockies
- The Land Trust Alliance
- The Nature Conservancy
- The Mule Deer Foundation (Western and Southwest Wyoming)
- The Wilderness Society
- The Wildlife Society
- Trout Unlimited
- Western Watersheds Project
- Wyoming Advocates for Animals
- Wyoming Nature Conservancy
- Wyoming Wildlife Federation

Congressional Delegation

- U.S. Senator Mike Enzi
  - Washington, D.C.
  - Jackson, Wyoming
- U.S. Senator John Barrasso
  - Washington, D.C.
  - Rock Springs, Wyoming
- U.S. Representative Barbara Cubin
  - Washington, D.C.
  - Rock Springs, Wyoming

U.S. Department of the Interior Agencies

- Bureau of Indian Affairs
- Bureau of Reclamation
  - Washington, D.C.
  - Provo, Utah
- Minerals Management Service
- National Park Service
  - Washington, D.C.
  - Denver, Colorado
  - Salt Lake City, Utah

- Office of Environmental Policy and Compliance
- Natural Resources Library
- Office of Surface Mining
- U.S. Fish and Wildlife Service
  - Washington, D.C.
  - Denver, Colorado
  - Cheyenne, Wyoming
- U.S. Geological Survey
  - Washington, D.C.
  - Cheyenne, Wyoming
- Bureau of Land Management
  - Washington, D.C.
  - Wyoming State Office
  - Wyoming Field Offices
    Buffalo, Casper, Cody, Lander, Newcastle, Pinedale, Rawlins, Rock Springs, and Worland
  - Utah Field Office
    Salt Lake City
  - Idaho Field Office
    Pocatello

Other Federal Agencies

- U.S. Environmental Protection Agency
- U.S. Department of Agriculture
  Forest Service
    Bighorn National Forest
    Bridger-Teton National Forest
    Medicine Bow/Routt National Forest
    Shoshone National Forest
  Natural Resources Conservation Service
    - Casper, Wyoming
    - Baggs, Wyoming
- U.S. Army Corp of Engineers
- U.S. Department of Energy
  Western Area Power Administration
  - Loveland, Colorado
  - Lakewood, Colorado
- Federal Highway Administration
- Federal Energy Regulatory Commission
- U.S. Government Printing Office
- Oceanic and Atmospheric Administration's National Weather Service

Libraries

- Library of Congress
- University of Wyoming Library
- Lincoln County Public Library
- Sweetwater County Public Library
- Sublette County Library
- Uinta County Public Library
- Western Wyoming College Library

Educational Institutions

- Eastern Wyoming College
- Western Wyoming Community College
  - Archeological Services
- University of Wyoming
  - Trustees
  - Geology Museum
  - Department of Rangeland Ecology
  - Department of Geology and Geophysics

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SECTION 7 CONSULTATION LETTERS

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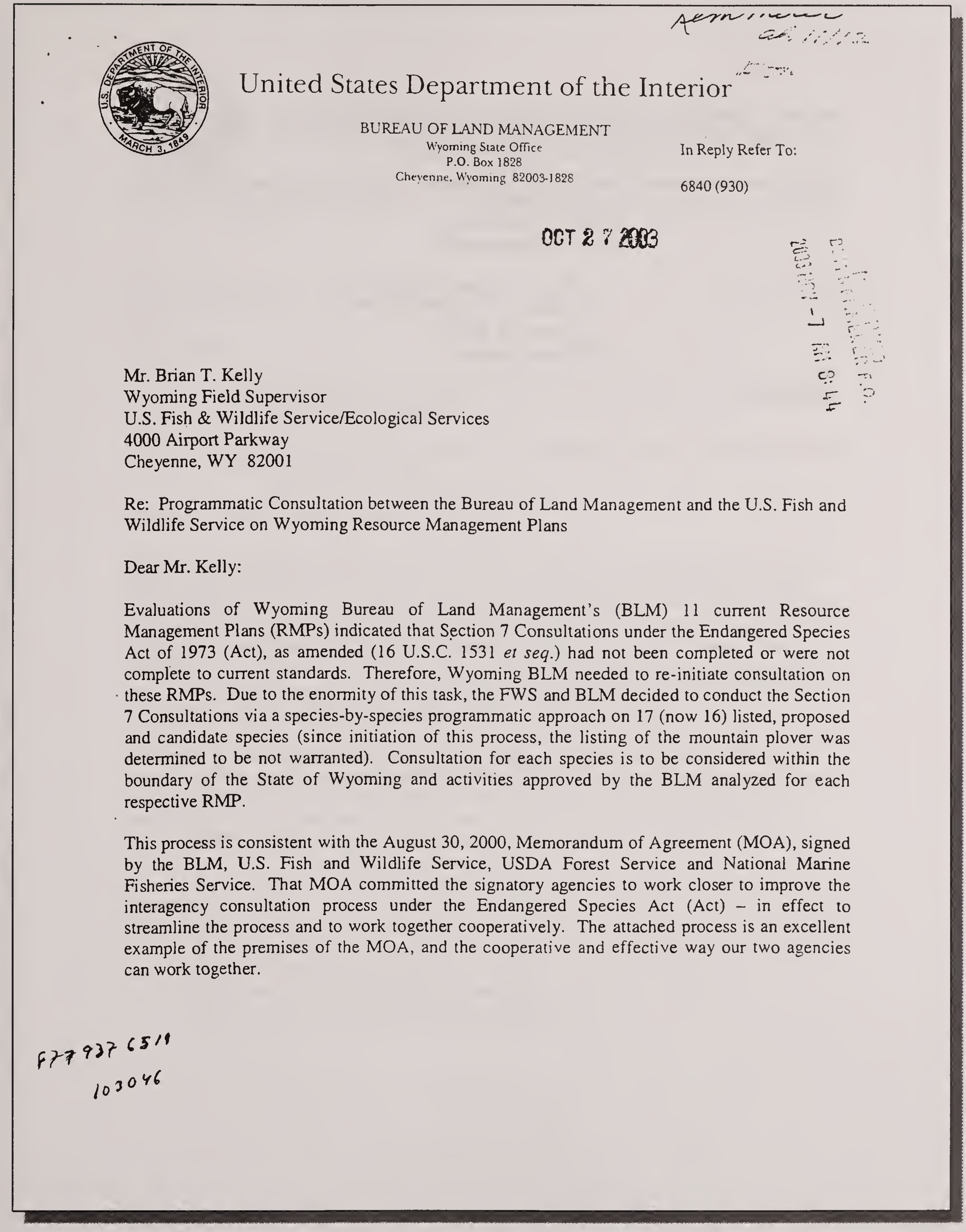

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Wyoming State Office
P.O. Box 1828
Cheyenne, Wyoming 82003-1828

In Reply Refer To:

6840 (930)

OCT 2 7 2003

2003 OCT -7 PM 3:44
CHEYENNE F.O.

Mr. Brian T. Kelly
Wyoming Field Supervisor
U.S. Fish & Wildlife Service/Ecological Services
4000 Airport Parkway
Cheyenne, WY 82001

Re: Programmatic Consultation between the Bureau of Land Management and the U.S. Fish and Wildlife Service on Wyoming Resource Management Plans

Dear Mr. Kelly:

Evaluations of Wyoming Bureau of Land Management's (BLM) 11 current Resource Management Plans (RMPs) indicated that Section 7 Consultations under the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*) had not been completed or were not complete to current standards. Therefore, Wyoming BLM needed to re-initiate consultation on these RMPs. Due to the enormity of this task, the FWS and BLM decided to conduct the Section 7 Consultations via a species-by-species programmatic approach on 17 (now 16) listed, proposed and candidate species (since initiation of this process, the listing of the mountain plover was determined to be not warranted). Consultation for each species is to be considered within the boundary of the State of Wyoming and activities approved by the BLM analyzed for each respective RMP.

This process is consistent with the August 30, 2000, Memorandum of Agreement (MOA), signed by the BLM, U.S. Fish and Wildlife Service, USDA Forest Service and National Marine Fisheries Service. That MOA committed the signatory agencies to work closer to improve the interagency consultation process under the Endangered Species Act (Act) – in effect to streamline the process and to work together cooperatively. The attached process is an excellent example of the premises of the MOA, and the cooperative and effective way our two agencies can work together.

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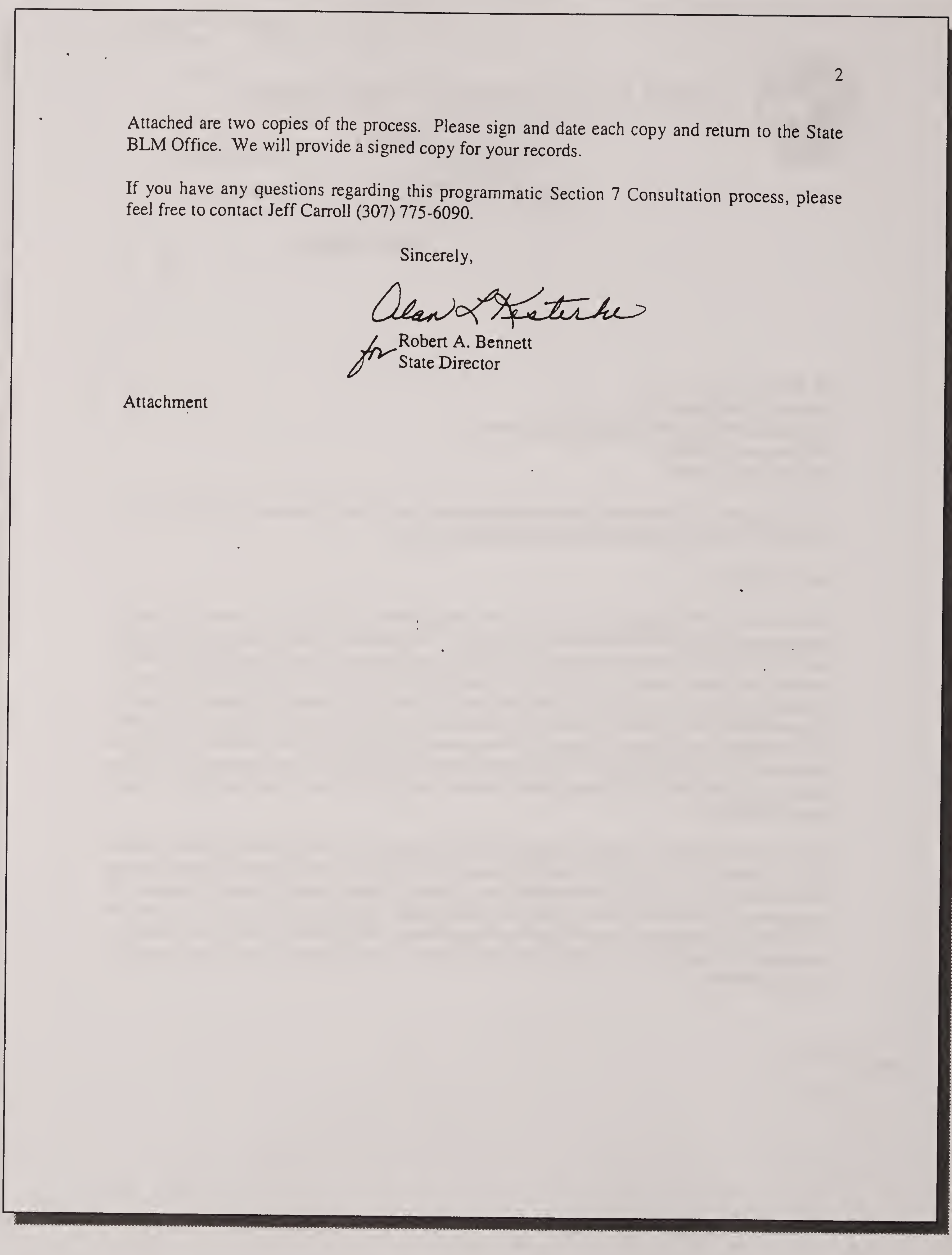

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Attached are two copies of the process. Please sign and date each copy and return to the State BLM Office. We will provide a signed copy for your records.

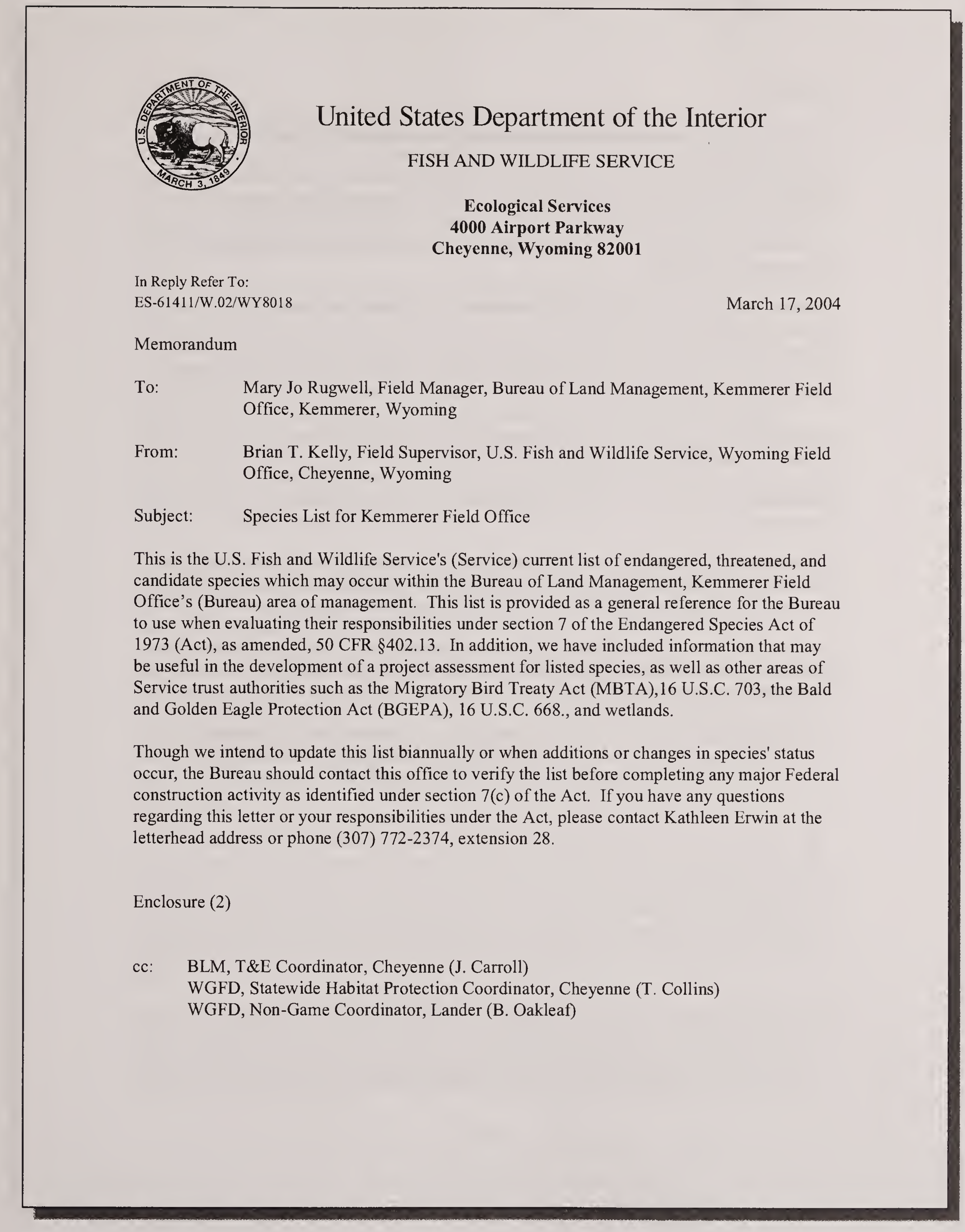
If you have any questions regarding this programmatic Section 7 Consultation process, please feel free to contact Jeff Carroll (307) 775-6090.

Sincerely,

Alan L Kesterke

for Robert A. Bennett
State Director

Attachment



MARCH 3, 1849

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
4000 Airport Parkway
Cheyenne, Wyoming 82001

In Reply Refer To:
ES-61411/W.02/WY8018

March 17, 2004

Memorandum

To: Mary Jo Rugwell, Field Manager, Bureau of Land Management, Kemmerer Field Office, Kemmerer, Wyoming

From: Brian T. Kelly, Field Supervisor, U.S. Fish and Wildlife Service, Wyoming Field Office, Cheyenne, Wyoming

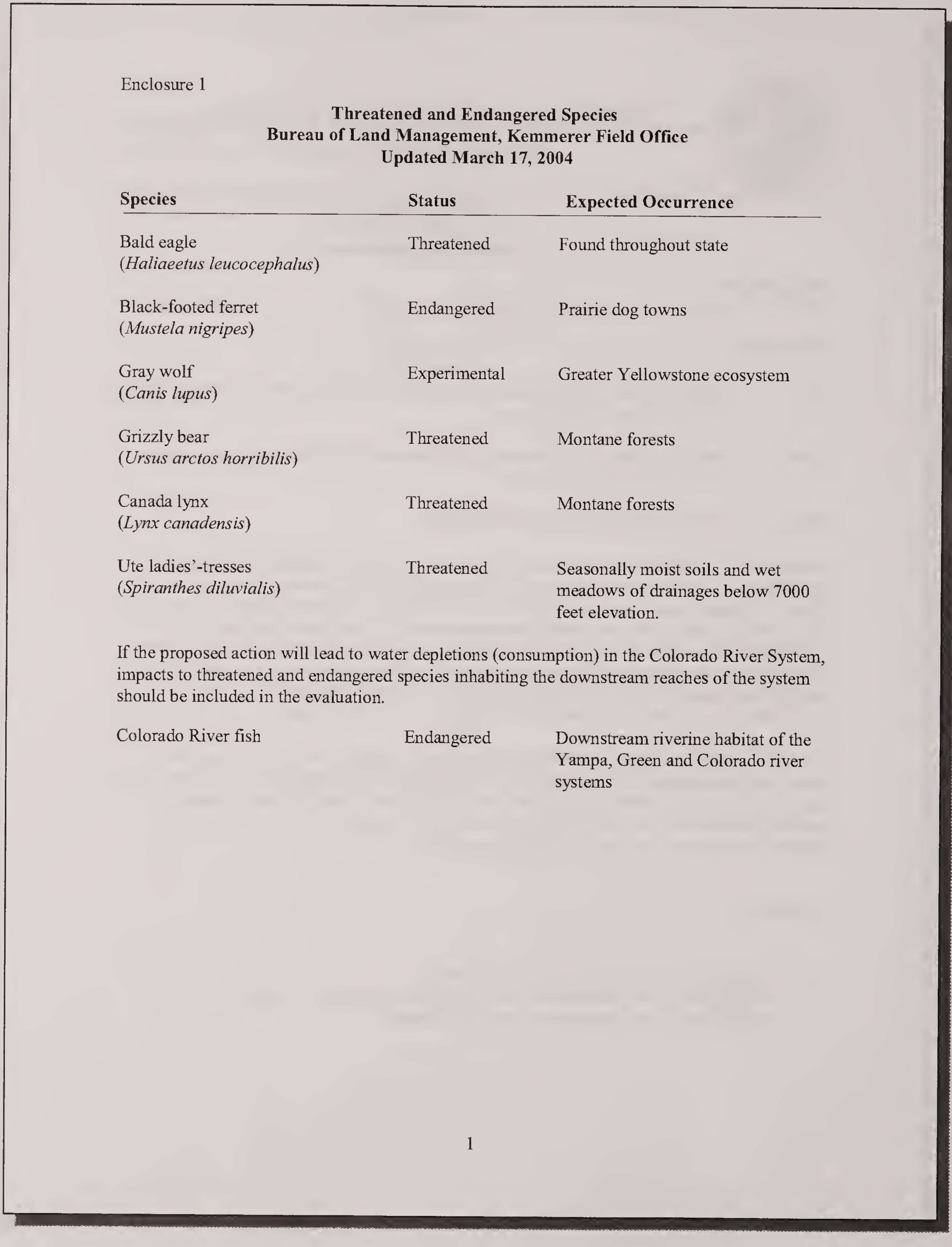
Subject: Species List for Kemmerer Field Office

This is the U.S. Fish and Wildlife Service's (Service) current list of endangered, threatened, and candidate species which may occur within the Bureau of Land Management, Kemmerer Field Office's (Bureau) area of management. This list is provided as a general reference for the Bureau to use when evaluating their responsibilities under section 7 of the Endangered Species Act of 1973 (Act), as amended, 50 CFR §402.13. In addition, we have included information that may be useful in the development of a project assessment for listed species, as well as other areas of Service trust authorities such as the Migratory Bird Treaty Act (MBTA),16 U.S.C. 703, the Bald and Golden Eagle Protection Act (BGEPA), 16 U.S.C. 668., and wetlands.

Though we intend to update this list biannually or when additions or changes in species' status occur, the Bureau should contact this office to verify the list before completing any major Federal construction activity as identified under section 7(c) of the Act. If you have any questions regarding this letter or your responsibilities under the Act, please contact Kathleen Erwin at the letterhead address or phone (307) 772-2374, extension 28.

Enclosure (2)

cc: BLM, T&E Coordinator, Cheyenne (J. Carroll)
WGFD, Statewide Habitat Protection Coordinator, Cheyenne (T. Collins)
WGFD, Non-Game Coordinator, Lander (B. Oakleaf)



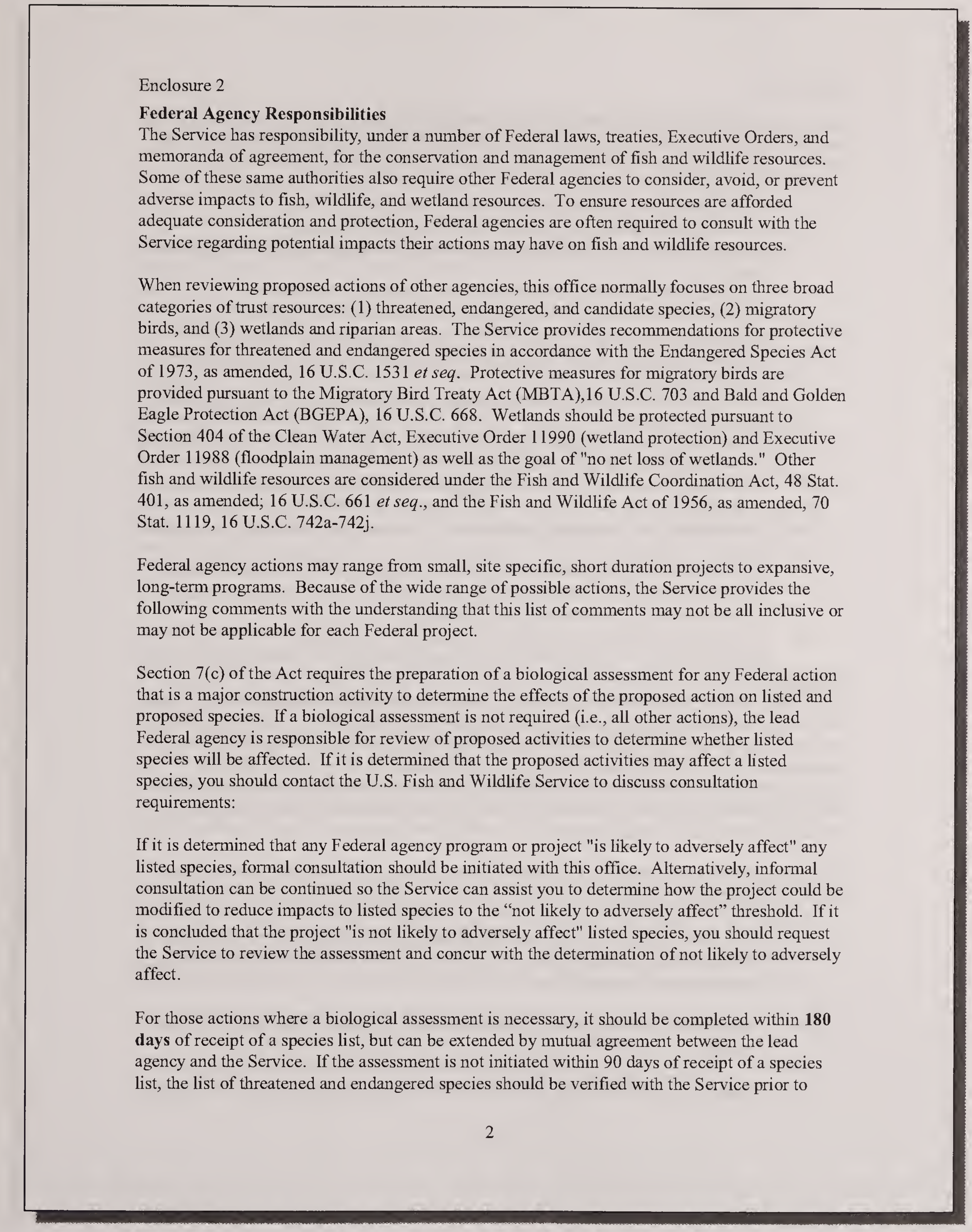
Enclosure 1

Threatened and Endangered Species
Bureau of Land Management, Kemmerer Field Office
Updated March 17, 2004

Species	**Status**	**Expected Occurrence**
Bald eagle (*Haliaeetus leucocephalus*)	Threatened	Found throughout state
Black-footed ferret (*Mustela nigripes*)	Endangered	Prairie dog towns
Gray wolf (*Canis lupus*)	Experimental	Greater Yellowstone ecosystem
Grizzly bear (*Ursus arctos horribilis*)	Threatened	Montane forests
Canada lynx (*Lynx canadensis*)	Threatened	Montane forests
Ute ladies'-tresses (*Spiranthes diluvialis*)	Threatened	Seasonally moist soils and wet meadows of drainages below 7000 feet elevation.

If the proposed action will lead to water depletions (consumption) in the Colorado River System, impacts to threatened and endangered species inhabiting the downstream reaches of the system should be included in the evaluation.

Colorado River fish	Endangered	Downstream riverine habitat of the Yampa, Green and Colorado river systems



Enclosure 2

Federal Agency Responsibilities

The Service has responsibility, under a number of Federal laws, treaties, Executive Orders, and memoranda of agreement, for the conservation and management of fish and wildlife resources. Some of these same authorities also require other Federal agencies to consider, avoid, or prevent adverse impacts to fish, wildlife, and wetland resources. To ensure resources are afforded adequate consideration and protection, Federal agencies are often required to consult with the Service regarding potential impacts their actions may have on fish and wildlife resources.

When reviewing proposed actions of other agencies, this office normally focuses on three broad categories of trust resources: (1) threatened, endangered, and candidate species, (2) migratory birds, and (3) wetlands and riparian areas. The Service provides recommendations for protective measures for threatened and endangered species in accordance with the Endangered Species Act of 1973, as amended, 16 U.S.C. 1531 *et seq.* Protective measures for migratory birds are provided pursuant to the Migratory Bird Treaty Act (MBTA),16 U.S.C. 703 and Bald and Golden Eagle Protection Act (BGEPA), 16 U.S.C. 668. Wetlands should be protected pursuant to Section 404 of the Clean Water Act, Executive Order 11990 (wetland protection) and Executive Order 11988 (floodplain management) as well as the goal of "no net loss of wetlands." Other fish and wildlife resources are considered under the Fish and Wildlife Coordination Act, 48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*, and the Fish and Wildlife Act of 1956, as amended, 70 Stat. 1119, 16 U.S.C. 742a-742j.

Federal agency actions may range from small, site specific, short duration projects to expansive, long-term programs. Because of the wide range of possible actions, the Service provides the following comments with the understanding that this list of comments may not be all inclusive or may not be applicable for each Federal project.

Section 7(c) of the Act requires the preparation of a biological assessment for any Federal action that is a major construction activity to determine the effects of the proposed action on listed and proposed species. If a biological assessment is not required (i.e., all other actions), the lead Federal agency is responsible for review of proposed activities to determine whether listed species will be affected. If it is determined that the proposed activities may affect a listed species, you should contact the U.S. Fish and Wildlife Service to discuss consultation requirements:

If it is determined that any Federal agency program or project "is likely to adversely affect" any listed species, formal consultation should be initiated with this office. Alternatively, informal consultation can be continued so the Service can assist you to determine how the project could be modified to reduce impacts to listed species to the “not likely to adversely affect” threshold. If it is concluded that the project "is not likely to adversely affect" listed species, you should request the Service to review the assessment and concur with the determination of not likely to adversely affect.

For those actions where a biological assessment is necessary, it should be completed within **180 days** of receipt of a species list, but can be extended by mutual agreement between the lead agency and the Service. If the assessment is not initiated within 90 days of receipt of a species list, the list of threatened and endangered species should be verified with the Service prior to

2

initiation of the assessment. The biological assessment may be undertaken as part of the agency's compliance of section 102 of the National Environmental Policy Act (NEPA), and incorporated into the NEPA documents. The Service recommends that biological assessments include:

1. A description of the project.
2. A description of the specific area potentially affected by the action.
3. The current status and habitat use of threatened and endangered species in the project area.
4. Discussion of the methods used to determine the information in item 3.
5. Direct and indirect impacts of the project to threatened and endangered species.
6. An analysis of the effects of the action on listed and proposed species and their habitats including cumulative impacts (pursuant to the Act) from State, or private projects in the area.
7. Measures that can potentially reduce or eliminate adverse impacts to threatened and endangered species.
8. The expected status of threatened and endangered species in the future (short and long term) during and after project completion.
9. Determination of "is likely to adversely affect" or "is not likely to adversely affect" for listed species.
10. Determination of "is likely to jeopardize" or "is not likely to jeopardize" for proposed species.
11. Alternatives to the proposed action considered, a summary of how impacts of those alternatives on listed and proposed species would differ from the proposed actions, and the reasons for not selecting those alternatives.
12. Citation of literature and personal contacts used in the assessment.

Migratory Birds
Under the Migratory Bird Treaty Act, 16 U.S.C. 703 and Bald and Golden Eagle Protection Act, 16 U.S.C. 668, the Federal agency has a mandatory obligation to protect the many species of migratory birds, including eagles and other raptors which may occur on lands under their jurisdiction. In order to promote the conservation of migratory bird populations and their habitats, the Service recommends that the Federal agency implement those strategies outlined within the Memorandum of Understanding directed by the President of the U.S. under the Executive Order 13186, where possible.

During project planning analysis of the following information is recommended to determine project effects to migratory birds:

1. The current status and habitat use of migratory birds in the project area. This may include number of individuals, breeding pairs, population trends, active nests within and adjacent to the project area.

2. An analysis of the effects of the proposed action on migratory bird species and their habitats.

3. Measures that will reduce or eliminate adverse impacts to migratory birds including

Enclosure 2

protective buffers, seasonal restrictions, maintenance of habitat within project area, raptor-proofing designs for powerlines, and netting of waste pits.

4. The projected short and long term impacts to migratory birds and their trends during and after project completion using monitoring, modeling and current literature.

Potential adverse effects to migratory birds from power lines should be identified and every attempt to mitigate such effects should be implemented. Structures that are identified as affecting birds should be made safe to prevent subsequent mortalities. If you determine that power poles and/or stretches of power line are resulting in electrocution of migratory birds, especially raptors, the U.S. Fish and Wildlife Service (Service) requests that specific information be documented regarding these mortalities. Based on regulations pursuant to the Migratory Bird Treaty Act (MBTA),16 U.S.C. 703 and Bald and Golden Eagle Protection Act (BGEPA), 16 U.S.C. 668., collecting, possessing, or moving the carcass can only be done by, State Game Wardens, Service Refuge Officers, Service Special Agents or persons holding a valid salvage permits issued by the Service and the applicable State. When a migratory bird mortality is observed the Service recommends that as much of the following information as possible be documented: legal location, all identifying numbers from the nearest power pole, date of observation, species, GPS location, photographs (pole number, top section of the pole, and the dead bird) and directions to the scene. Additionally, call and email Dominic Domenici of the Service's Law Enforcement Office at 307-261-6365 / dominic_domenici@fws.gov to report your observation and obtain further guidance. The Service appreciates your efforts to protect migratory birds.

Candidate Species

Many Federal agencies have policies to protect candidate species from further population declines. The Service would appreciate receiving any information available on the status of the yellow-billed cuckoo (*Coccyzus americanus*), which may occur in riparian areas west of the continental divide. In addition, if this species is listed prior to the completion of a project, unnecessary delays may be avoided by considering project impacts to candidates now.

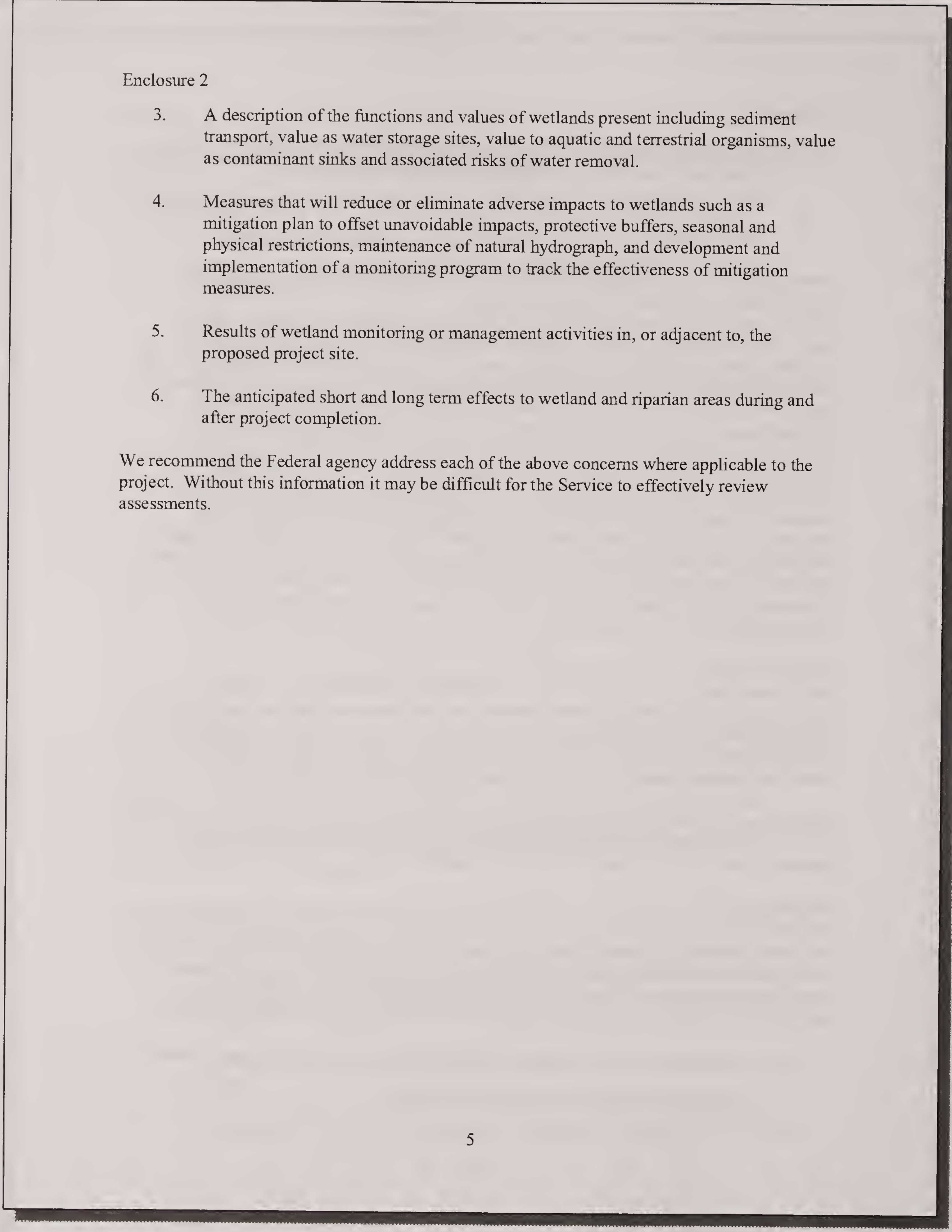
Should this species be proposed for listing, the Federal agency would be required to confer with the Service if that agency determines their action (e.g. approval of the project) is likely to jeopardize the continued existence of any of these species.

Wetlands

The functions and values of wetlands are well documented and are especially important in the arid west. Substantial degradation diminishes the effectiveness of wetlands to function as food, cover, and breeding sites for wetland dependent species; sediment transport systems; water retention/storage sites; contaminant sinks; and chemical exchange sites. To ensure the Service has sufficient information to assess project impacts on wetlands, assessments should include:

1. An enumeration of the acreage of wetlands, by type, impacted by the proposed action.

2. A discussion of why wetlands cannot be avoided.



Enclosure 2

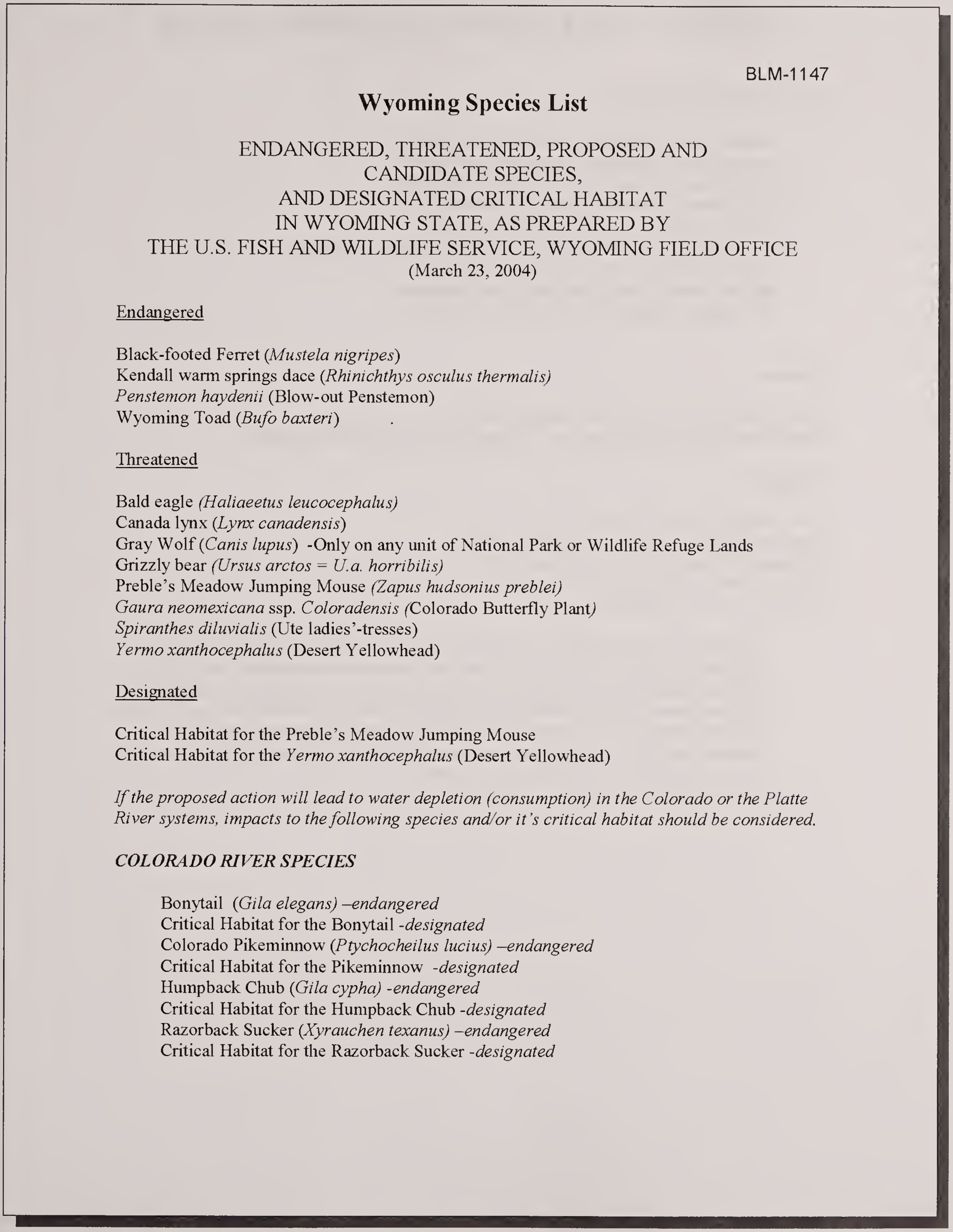
3. A description of the functions and values of wetlands present including sediment transport, value as water storage sites, value to aquatic and terrestrial organisms, value as contaminant sinks and associated risks of water removal.

4. Measures that will reduce or eliminate adverse impacts to wetlands such as a mitigation plan to offset unavoidable impacts, protective buffers, seasonal and physical restrictions, maintenance of natural hydrograph, and development and implementation of a monitoring program to track the effectiveness of mitigation measures.

5. Results of wetland monitoring or management activities in, or adjacent to, the proposed project site.

6. The anticipated short and long term effects to wetland and riparian areas during and after project completion.

We recommend the Federal agency address each of the above concerns where applicable to the project. Without this information it may be difficult for the Service to effectively review assessments.



BLM-1147

Wyoming Species List

ENDANGERED, THREATENED, PROPOSED AND
CANDIDATE SPECIES,
AND DESIGNATED CRITICAL HABITAT
IN WYOMING STATE, AS PREPARED BY
THE U.S. FISH AND WILDLIFE SERVICE, WYOMING FIELD OFFICE
(March 23, 2004)

Endangered

Black-footed Ferret (*Mustela nigripes*)
Kendall warm springs dace (*Rhinichthys osculus thermalis)*
Penstemon haydenii (Blow-out Penstemon)
Wyoming Toad (*Bufo baxteri*) .

Threatened

Bald eagle *(Haliaeetus leucocephalus)*
Canada lynx (*Lynx canadensis*)
Gray Wolf (*Canis lupus*) -Only on any unit of National Park or Wildlife Refuge Lands
Grizzly bear *(Ursus arctos = U.a. horribilis)*
Preble's Meadow Jumping Mouse *(Zapus hudsonius preblei)*
Gaura neomexicana ssp. *Coloradensis (*Colorado Butterfly Plant*)*
Spiranthes diluvialis (Ute ladies'-tresses)
Yermo xanthocephalus (Desert Yellowhead)

Designated

Critical Habitat for the Preble's Meadow Jumping Mouse
Critical Habitat for the *Yermo xanthocephalus* (Desert Yellowhead)

If the proposed action will lead to water depletion (consumption) in the Colorado or the Platte River systems, impacts to the following species and/or it's critical habitat should be considered.

COLORADO RIVER SPECIES

Bonytail (*Gila elegans) –endangered*
Critical Habitat for the Bonytail -*designated*
Colorado Pikeminnow (*Ptychocheilus lucius) –endangered*
Critical Habitat for the Pikeminnow -*designated*
Humpback Chub (*Gila cypha) -endangered*
Critical Habitat for the Humpback Chub -*designated*
Razorback Sucker (*Xyrauchen texanus) –endangered*
Critical Habitat for the Razorback Sucker -*designated*

PLATTE RIVER SPECIES

Eskimo Curlew *(Numenius borealis)-endangered*
Interior Least Tern *(Sterna antillarum) -endangered*
Pallid Sturgeon *(Scaphirhynchus albus) -endangered*
Piping Plover *(Charadrius melodus)-threatened*
Critical Habitat for the Piping Plover *-designated*
Western Prairie Fringed Orchid *(Platanthera praeclara)-threatened*
Whooping Crane *(Grus Americana) –endangered*
Critical Habitat for the Whooping Crane *-designated*
Bald Eagle *(Haliaeetus leucocephalus)-threatened*

Proposed

Gray Wolf (*Canis lupus*) –Experimental population
Black-footed Ferret (*Mustela nigripes*) –Shirley Basin Experimental population

Candidate

Arctic Grayling *(Thymallus arcticus)*
Black-tailed Prairie Dog *(Cynomys ludovicianus)*
Yellow-billed Cuckoo *(Coccyzus americanus)*
Western Boreal Toad *(Bufo boreas boreas)*
Botrychium lineare (Slender moonwort)

Candidate species are those species for which the U.S. Fish and Wildlife Service has sufficient information to propose for listing as threatened or endangered under the Act. Species of concern (some of which are former Category 1 and Category 2 candidates) are those species whose conservation standing is of concern to the Service, but for which status information is still needed. Conservation measures for species of concern and candidate species are voluntary but recommended. Protection provided to these species now may preclude possible listing in the future.

NATIVE AMERICAN CONSULTATION LETTERS

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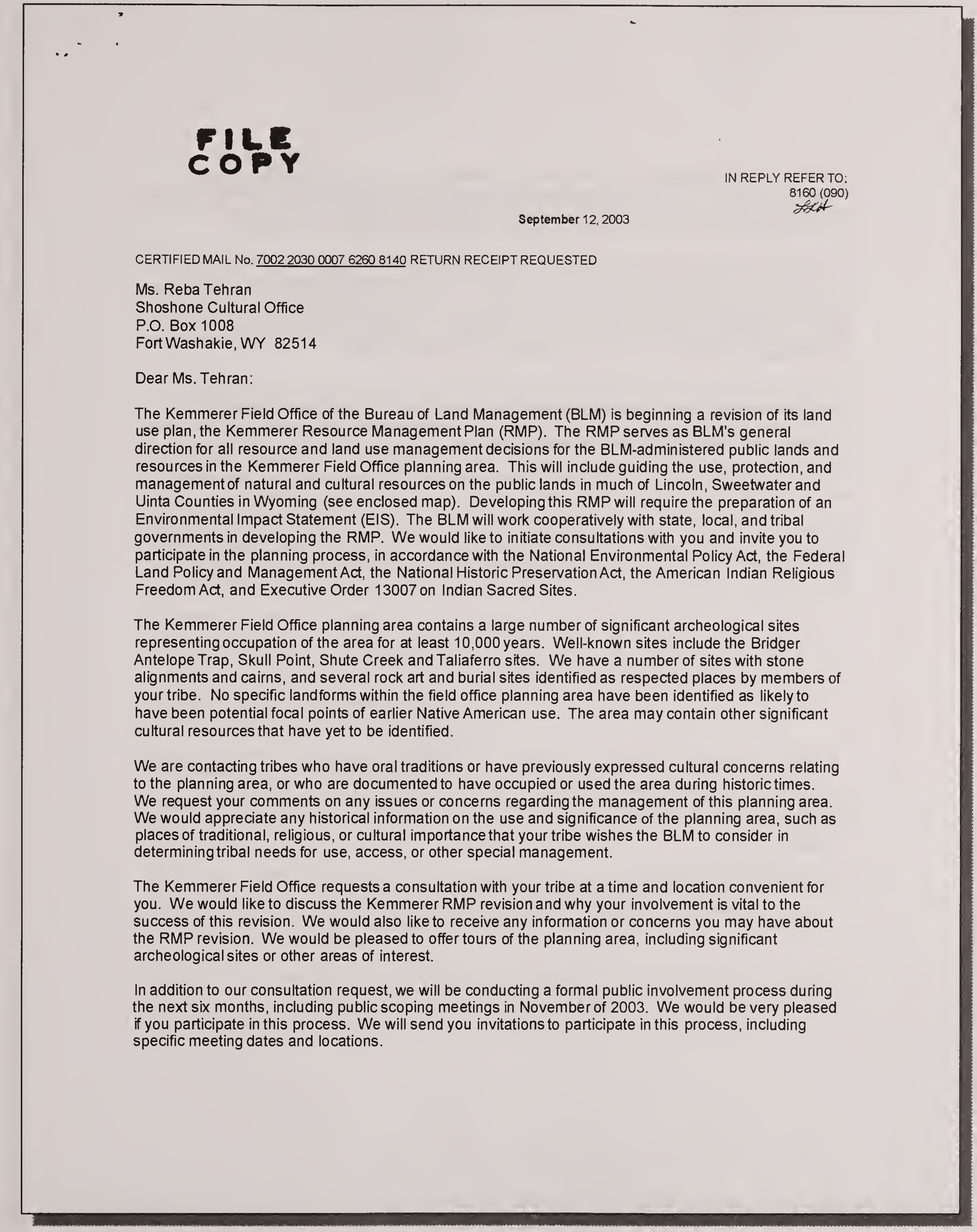

FILE
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IN REPLY REFER TO:
8160 (090)

September 12, 2003

CERTIFIED MAIL No. 7002 2030 0007 6260 8140 RETURN RECEIPT REQUESTED

Ms. Reba Tehran
Shoshone Cultural Office
P.O. Box 1008
Fort Washakie, WY 82514

Dear Ms. Tehran:

The Kemmerer Field Office of the Bureau of Land Management (BLM) is beginning a revision of its land use plan, the Kemmerer Resource Management Plan (RMP). The RMP serves as BLM's general direction for all resource and land use management decisions for the BLM-administered public lands and resources in the Kemmerer Field Office planning area. This will include guiding the use, protection, and management of natural and cultural resources on the public lands in much of Lincoln, Sweetwater and Uinta Counties in Wyoming (see enclosed map). Developing this RMP will require the preparation of an Environmental Impact Statement (EIS). The BLM will work cooperatively with state, local, and tribal governments in developing the RMP. We would like to initiate consultations with you and invite you to participate in the planning process, in accordance with the National Environmental Policy Act, the Federal Land Policy and Management Act, the National Historic Preservation Act, the American Indian Religious Freedom Act, and Executive Order 13007 on Indian Sacred Sites.

The Kemmerer Field Office planning area contains a large number of significant archeological sites representing occupation of the area for at least 10,000 years. Well-known sites include the Bridger Antelope Trap, Skull Point, Shute Creek and Taliaferro sites. We have a number of sites with stone alignments and cairns, and several rock art and burial sites identified as respected places by members of your tribe. No specific landforms within the field office planning area have been identified as likely to have been potential focal points of earlier Native American use. The area may contain other significant cultural resources that have yet to be identified.

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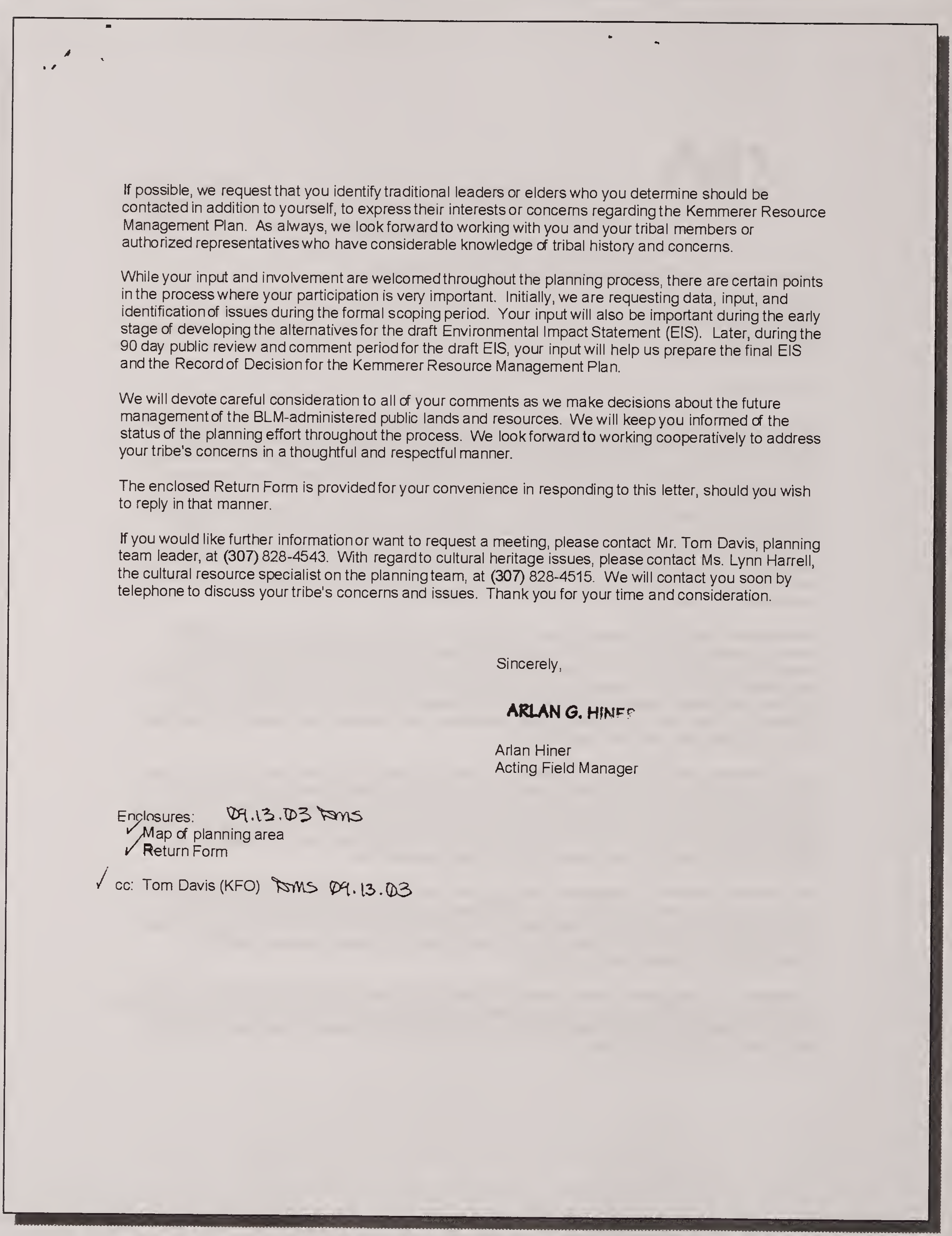
The Kemmerer Field Office requests a consultation with your tribe at a time and location convenient for you. We would like to discuss the Kemmerer RMP revision and why your involvement is vital to the success of this revision. We would also like to receive any information or concerns you may have about the RMP revision. We would be pleased to offer tours of the planning area, including significant archeological sites or other areas of interest.

In addition to our consultation request, we will be conducting a formal public involvement process during the next six months, including public scoping meetings in November of 2003. We would be very pleased if you participate in this process. We will send you invitations to participate in this process, including specific meeting dates and locations.



If possible, we request that you identify traditional leaders or elders who you determine should be contacted in addition to yourself, to express their interests or concerns regarding the Kemmerer Resource Management Plan. As always, we look forward to working with you and your tribal members or authorized representatives who have considerable knowledge of tribal history and concerns.

While your input and involvement are welcomed throughout the planning process, there are certain points in the process where your participation is very important. Initially, we are requesting data, input, and identification of issues during the formal scoping period. Your input will also be important during the early stage of developing the alternatives for the draft Environmental Impact Statement (EIS). Later, during the 90 day public review and comment period for the draft EIS, your input will help us prepare the final EIS and the Record of Decision for the Kemmerer Resource Management Plan.

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If you would like further information or want to request a meeting, please contact Mr. Tom Davis, planning team leader, at (307) 828-4543. With regard to cultural heritage issues, please contact Ms. Lynn Harrell, the cultural resource specialist on the planning team, at (307) 828-4515. We will contact you soon by telephone to discuss your tribe's concerns and issues. Thank you for your time and consideration.

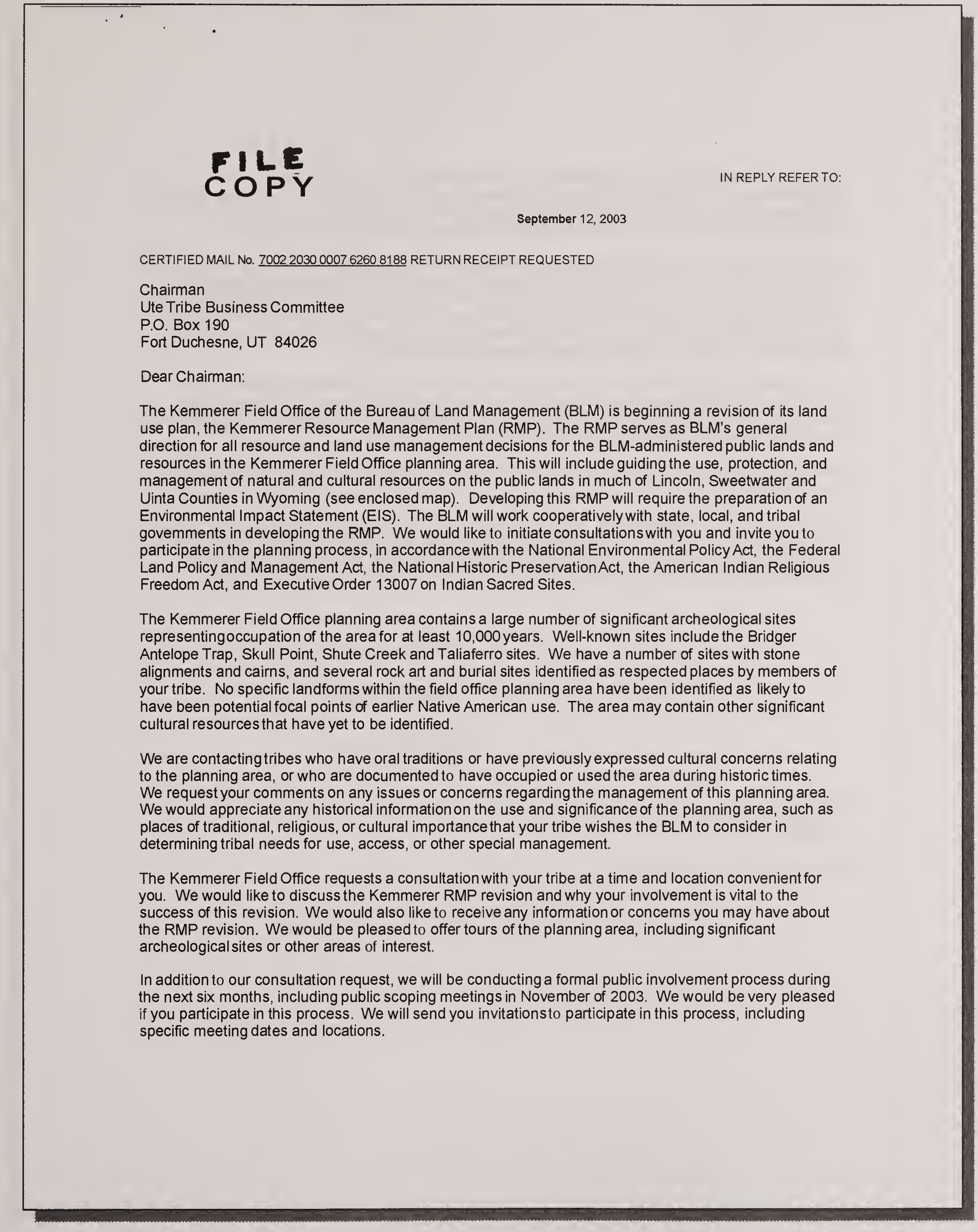
Sincerely,

ARLAN G. HINER

Arlan Hiner
Acting Field Manager

Enclosures: 09.13.03 DMS
✓ Map of planning area
✓ Return Form

✓ cc: Tom Davis (KFO) DMS 09.13.03



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IN REPLY REFER TO:

September 12, 2003

CERTIFIED MAIL No. 7002 2030 0007 6260 8188 RETURN RECEIPT REQUESTED

Chairman
Ute Tribe Business Committee
P.O. Box 190
Fort Duchesne, UT 84026

Dear Chairman:

The Kemmerer Field Office of the Bureau of Land Management (BLM) is beginning a revision of its land use plan, the Kemmerer Resource Management Plan (RMP). The RMP serves as BLM's general direction for all resource and land use management decisions for the BLM-administered public lands and resources in the Kemmerer Field Office planning area. This will include guiding the use, protection, and management of natural and cultural resources on the public lands in much of Lincoln, Sweetwater and Uinta Counties in Wyoming (see enclosed map). Developing this RMP will require the preparation of an Environmental Impact Statement (EIS). The BLM will work cooperatively with state, local, and tribal governments in developing the RMP. We would like to initiate consultations with you and invite you to participate in the planning process, in accordance with the National Environmental Policy Act, the Federal Land Policy and Management Act, the National Historic Preservation Act, the American Indian Religious Freedom Act, and Executive Order 13007 on Indian Sacred Sites.

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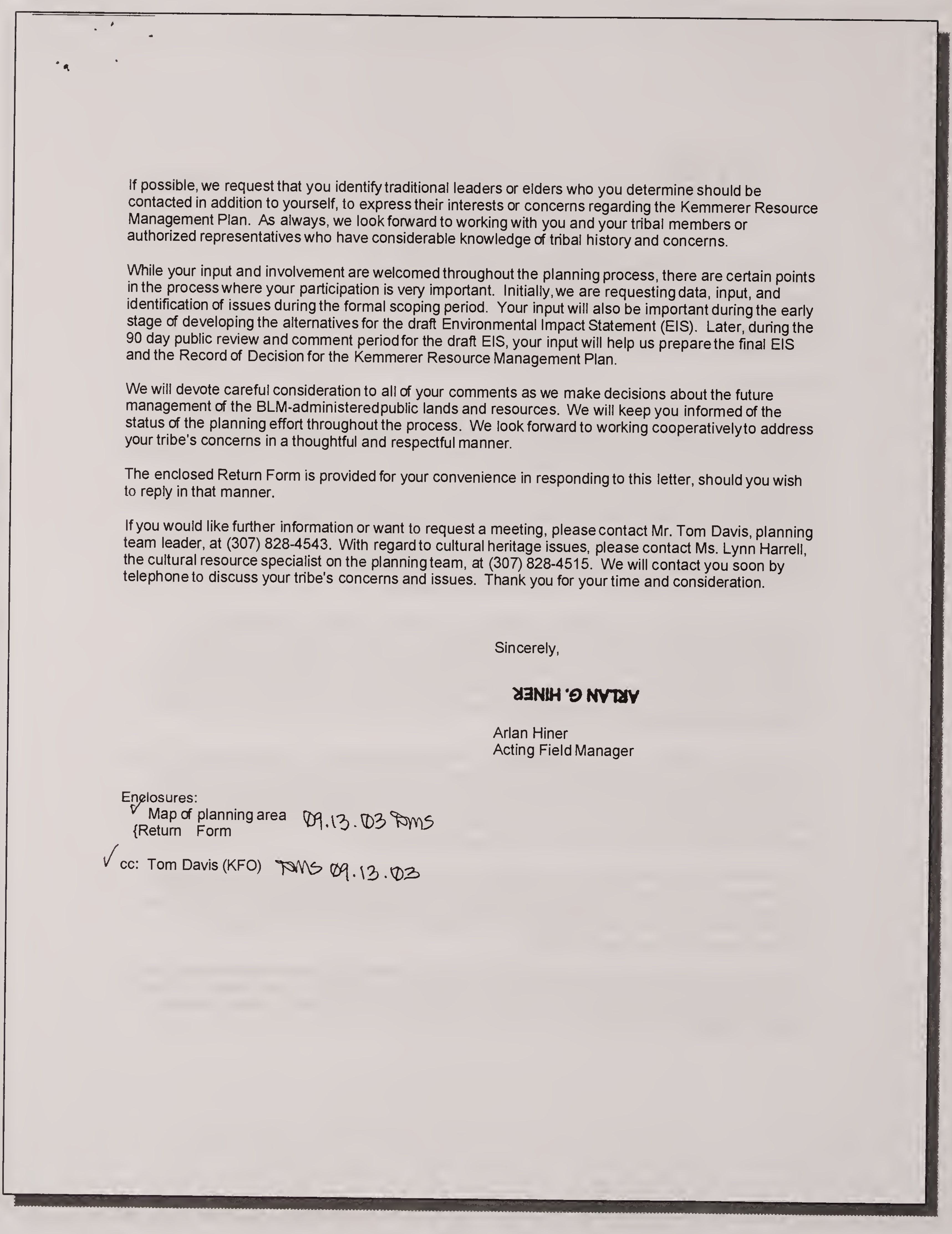

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ARLAN G. HINER

Arlan Hiner
Acting Field Manager

Enclosures:
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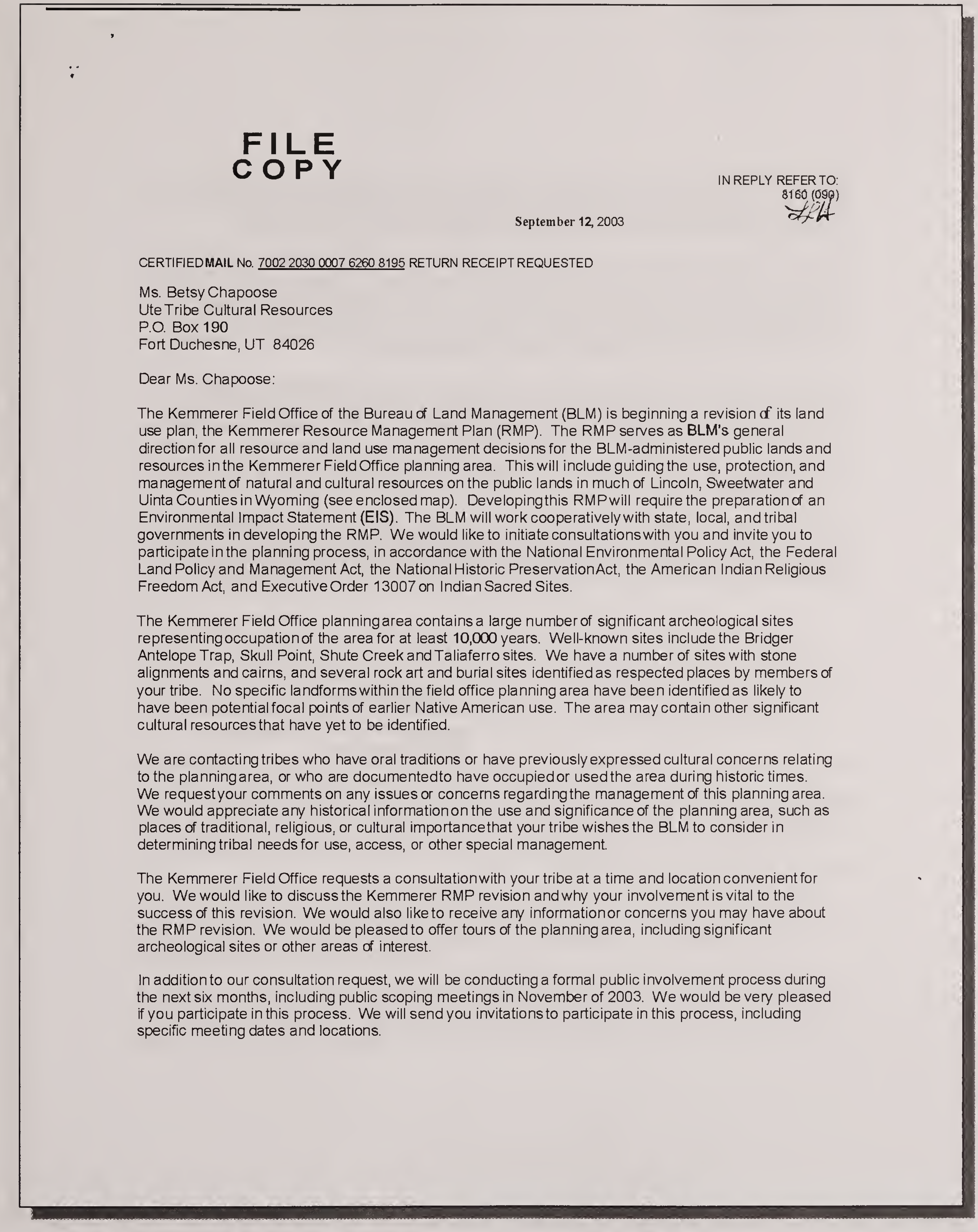

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IN REPLY REFER TO:
8160 (090)

September 12, 2003

CERTIFIED MAIL No. 7002 2030 0007 6260 8195 RETURN RECEIPT REQUESTED

Ms. Betsy Chapoose
Ute Tribe Cultural Resources
P.O. Box 190
Fort Duchesne, UT 84026

Dear Ms. Chapoose:

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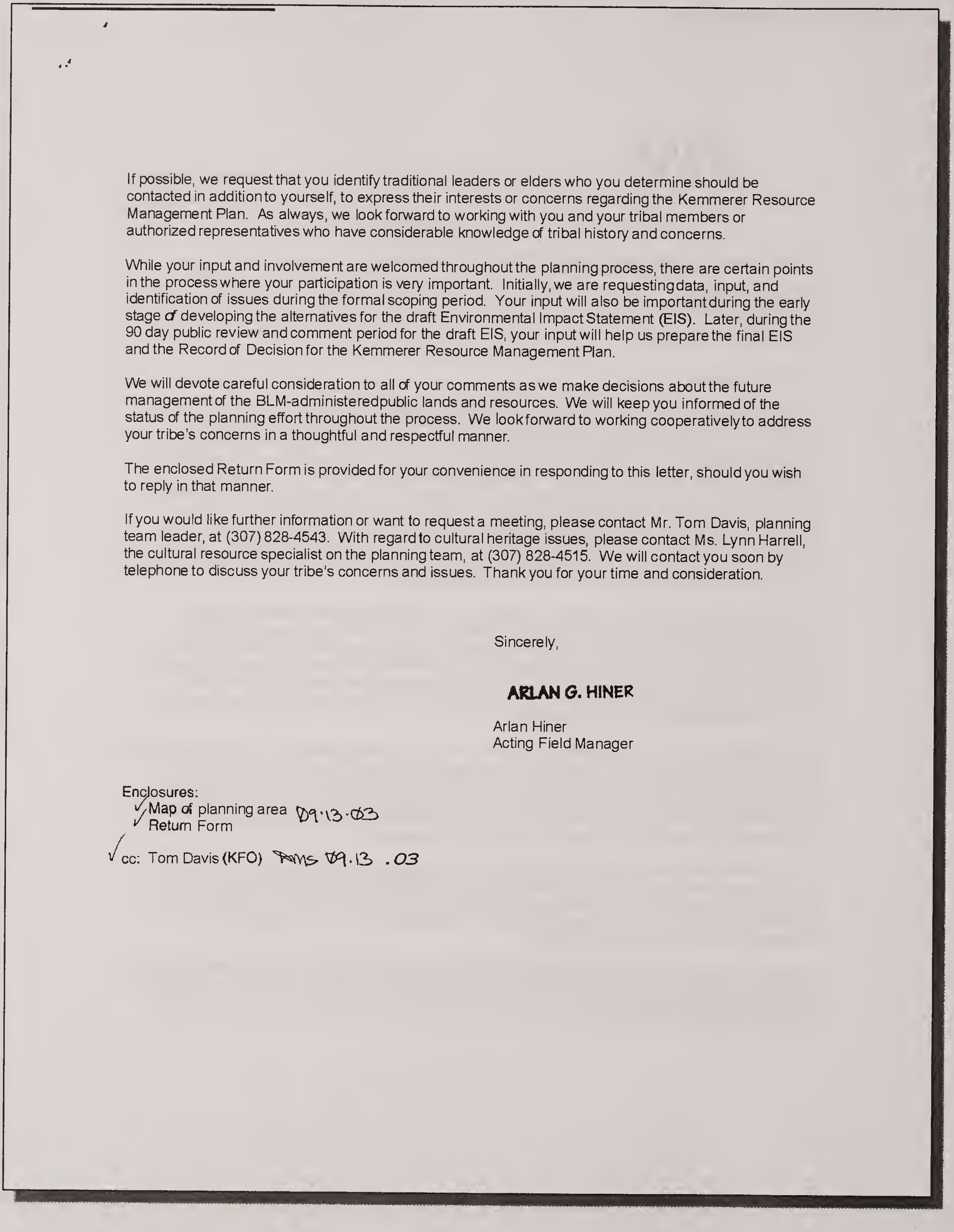

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ARLAN G. HINER

Arlan Hiner
Acting Field Manager

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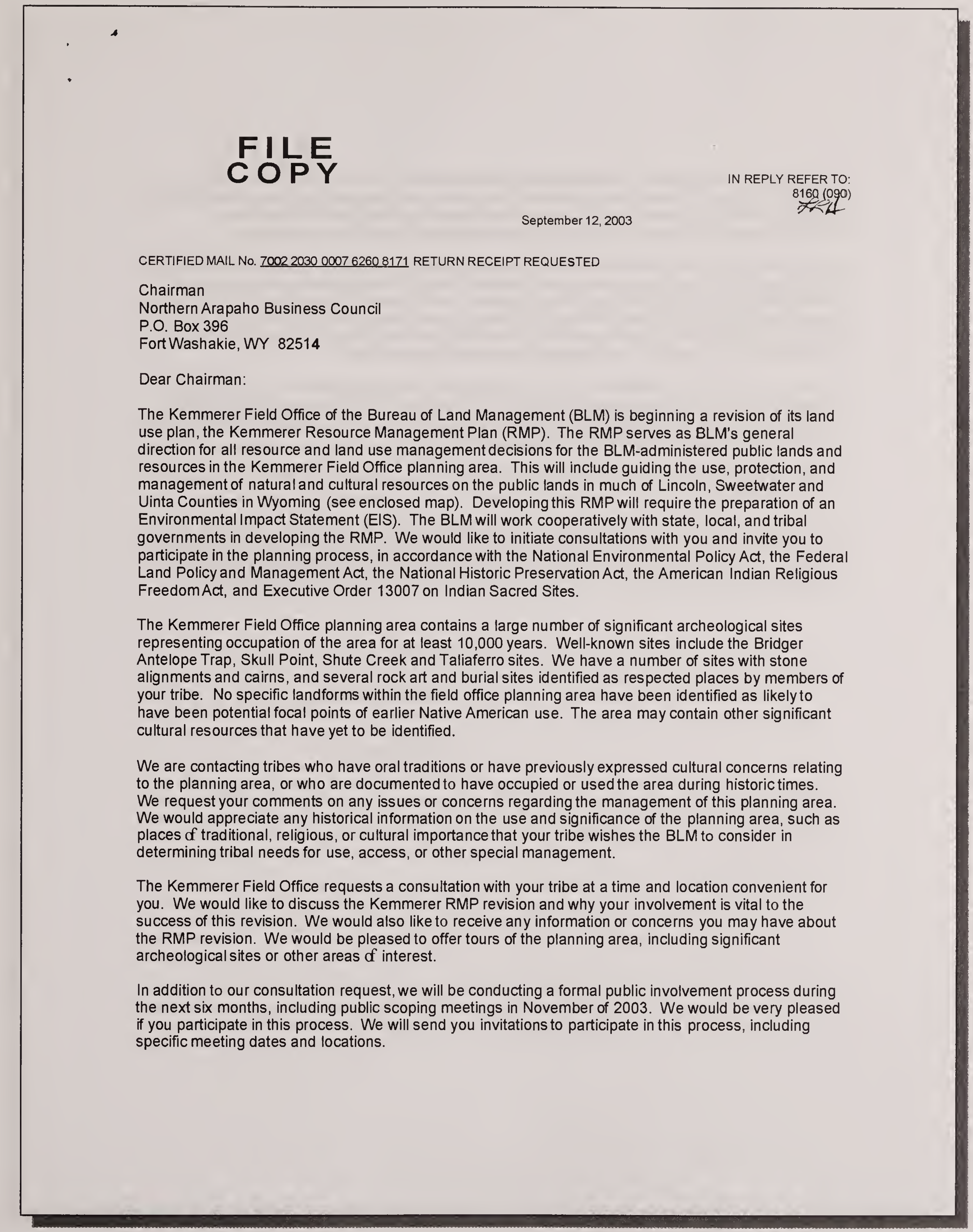
✓ Return Form

✓ cc: Tom Davis (KFO) Tms 09.13 .03



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IN REPLY REFER TO:
8160 (090)

September 12, 2003

CERTIFIED MAIL No. 7002 2030 0007 6260 8171 RETURN RECEIPT REQUESTED

Chairman
Northern Arapaho Business Council
P.O. Box 396
Fort Washakie, WY 82514

Dear Chairman:

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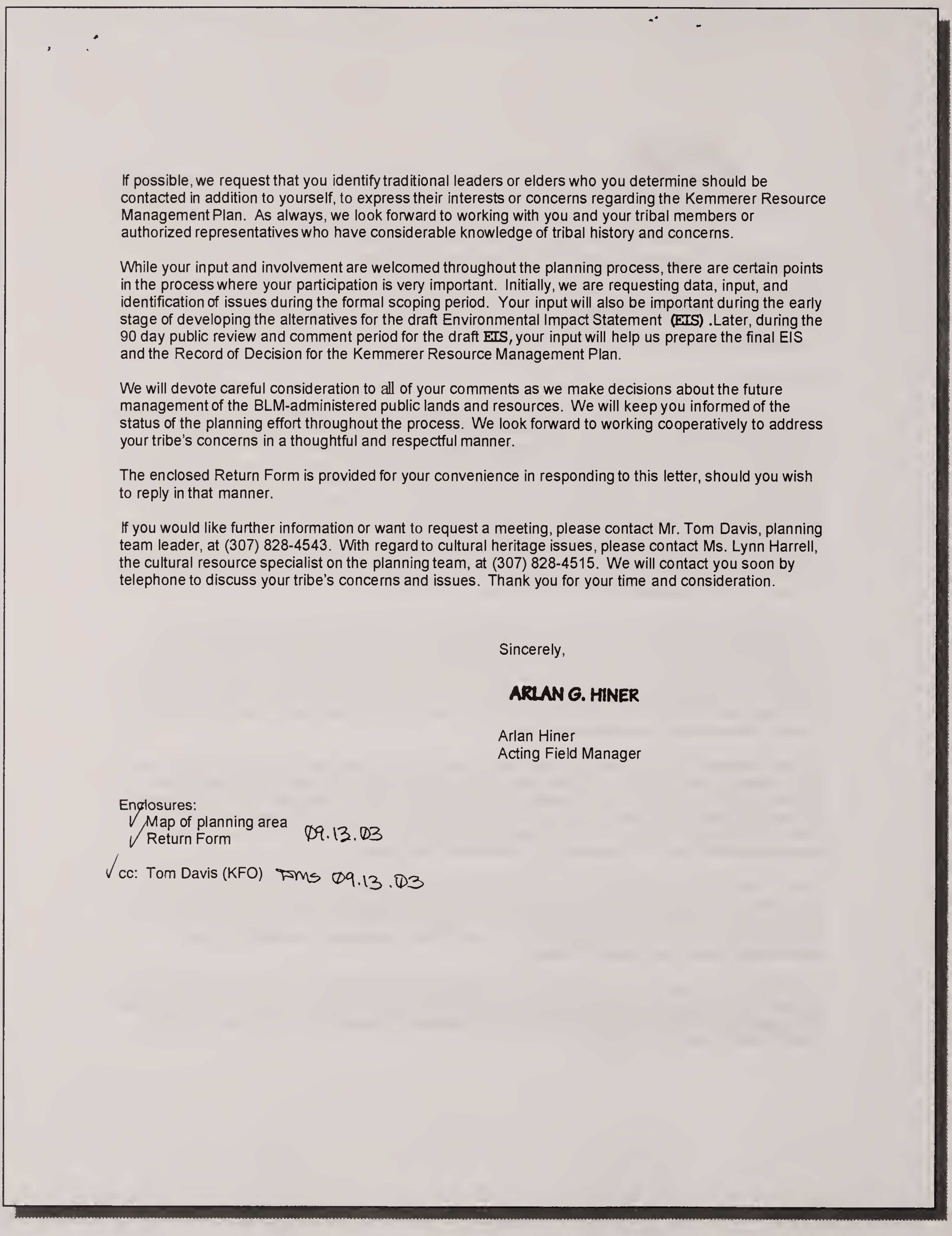

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ARLAN G. HINER

Arlan Hiner
Acting Field Manager

Enclosures:
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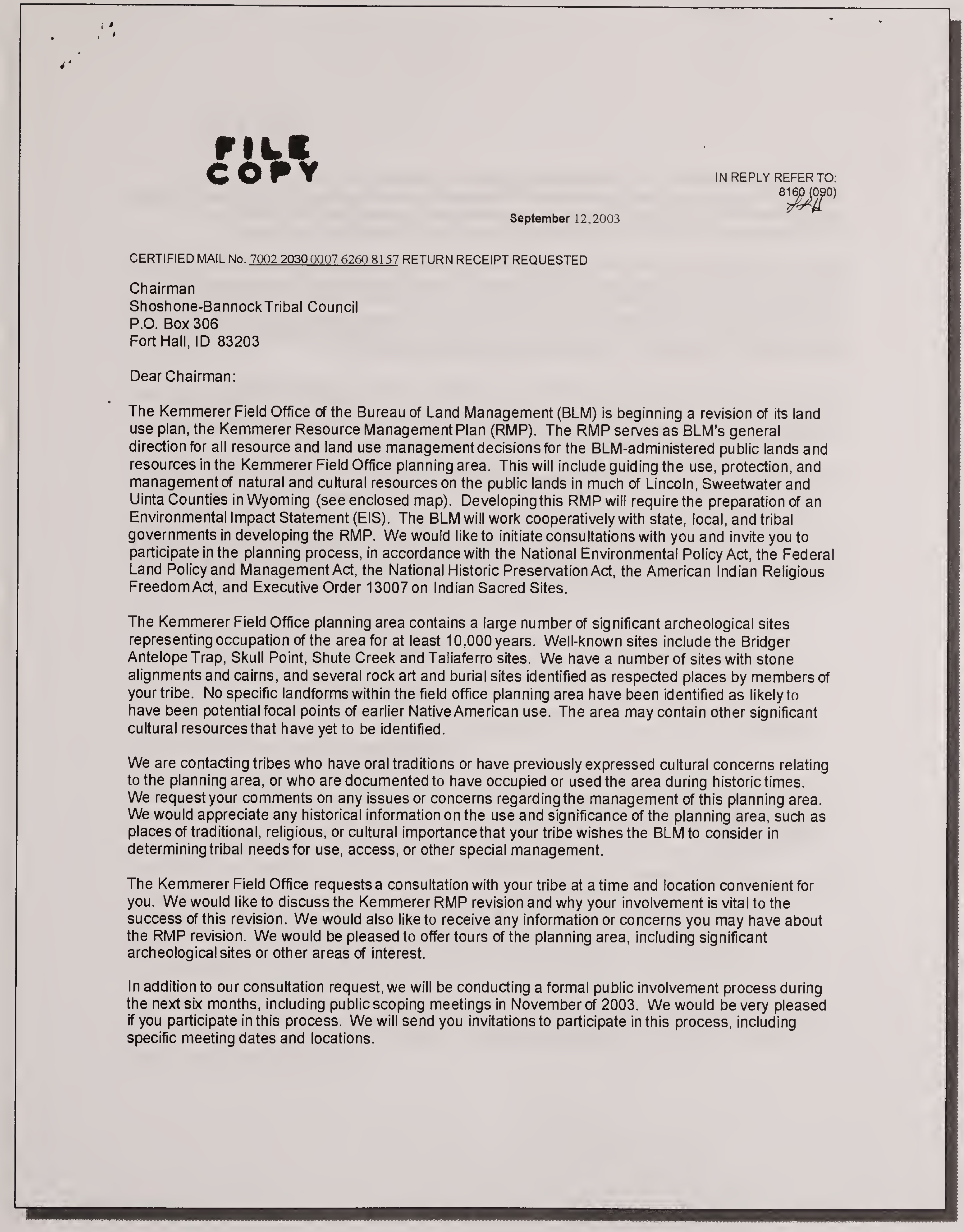
✓ Return Form 09.13.03

✓ cc: Tom Davis (KFO) TMS 09.13.03



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IN REPLY REFER TO:
8160 (090)

September 12, 2003

CERTIFIED MAIL No. 7002 2030 0007 6260 8157 RETURN RECEIPT REQUESTED

Chairman
Shoshone-Bannock Tribal Council
P.O. Box 306
Fort Hall, ID 83203

Dear Chairman:

The Kemmerer Field Office of the Bureau of Land Management (BLM) is beginning a revision of its land use plan, the Kemmerer Resource Management Plan (RMP). The RMP serves as BLM's general direction for all resource and land use management decisions for the BLM-administered public lands and resources in the Kemmerer Field Office planning area. This will include guiding the use, protection, and management of natural and cultural resources on the public lands in much of Lincoln, Sweetwater and Uinta Counties in Wyoming (see enclosed map). Developing this RMP will require the preparation of an Environmental Impact Statement (EIS). The BLM will work cooperatively with state, local, and tribal governments in developing the RMP. We would like to initiate consultations with you and invite you to participate in the planning process, in accordance with the National Environmental Policy Act, the Federal Land Policy and Management Act, the National Historic Preservation Act, the American Indian Religious Freedom Act, and Executive Order 13007 on Indian Sacred Sites.

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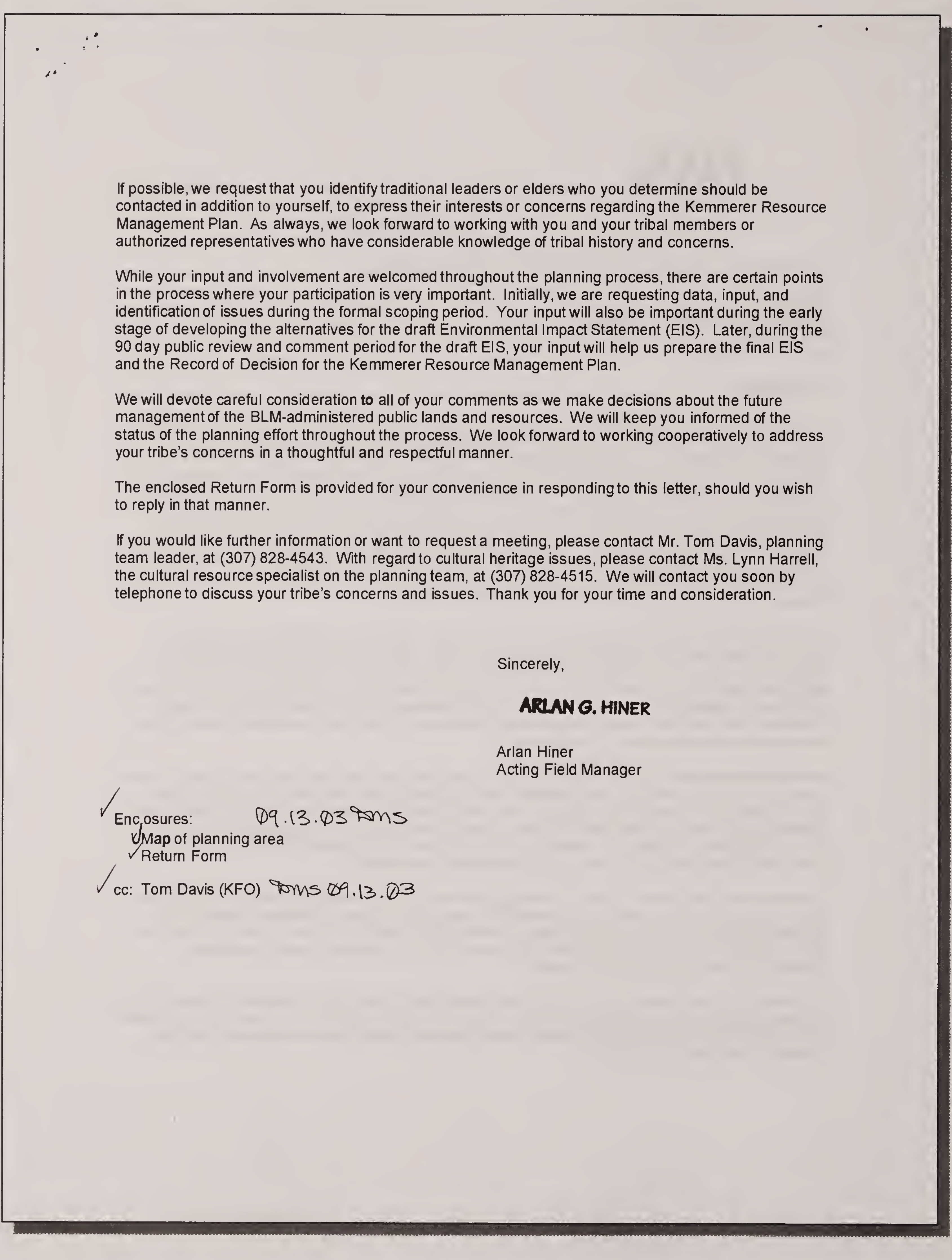

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✓ Map of planning area
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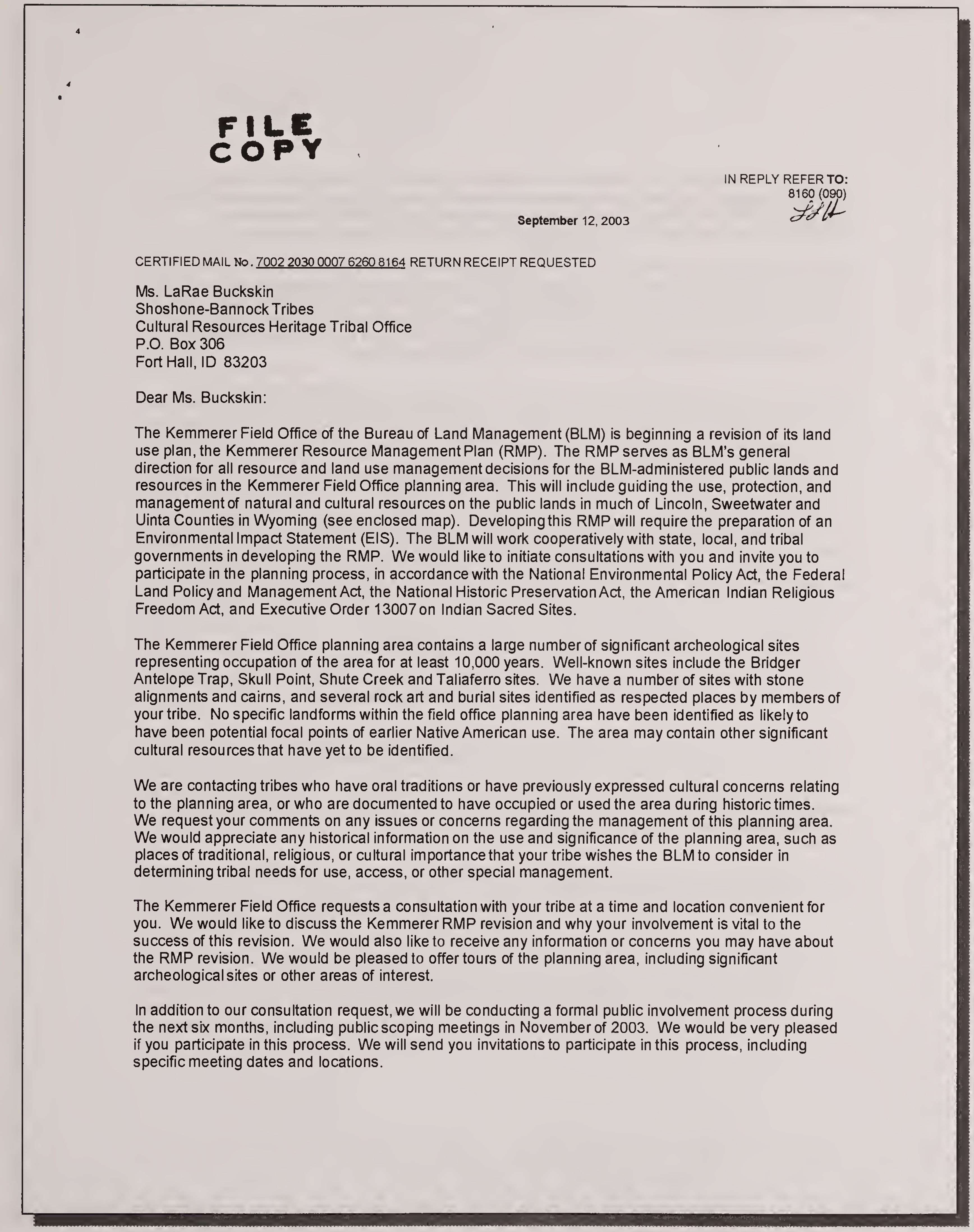

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8160 (090)

September 12, 2003

CERTIFIED MAIL No. 7002 2030 0007 6260 8164 RETURN RECEIPT REQUESTED

Ms. LaRae Buckskin
Shoshone-Bannock Tribes
Cultural Resources Heritage Tribal Office
P.O. Box 306
Fort Hall, ID 83203

Dear Ms. Buckskin:

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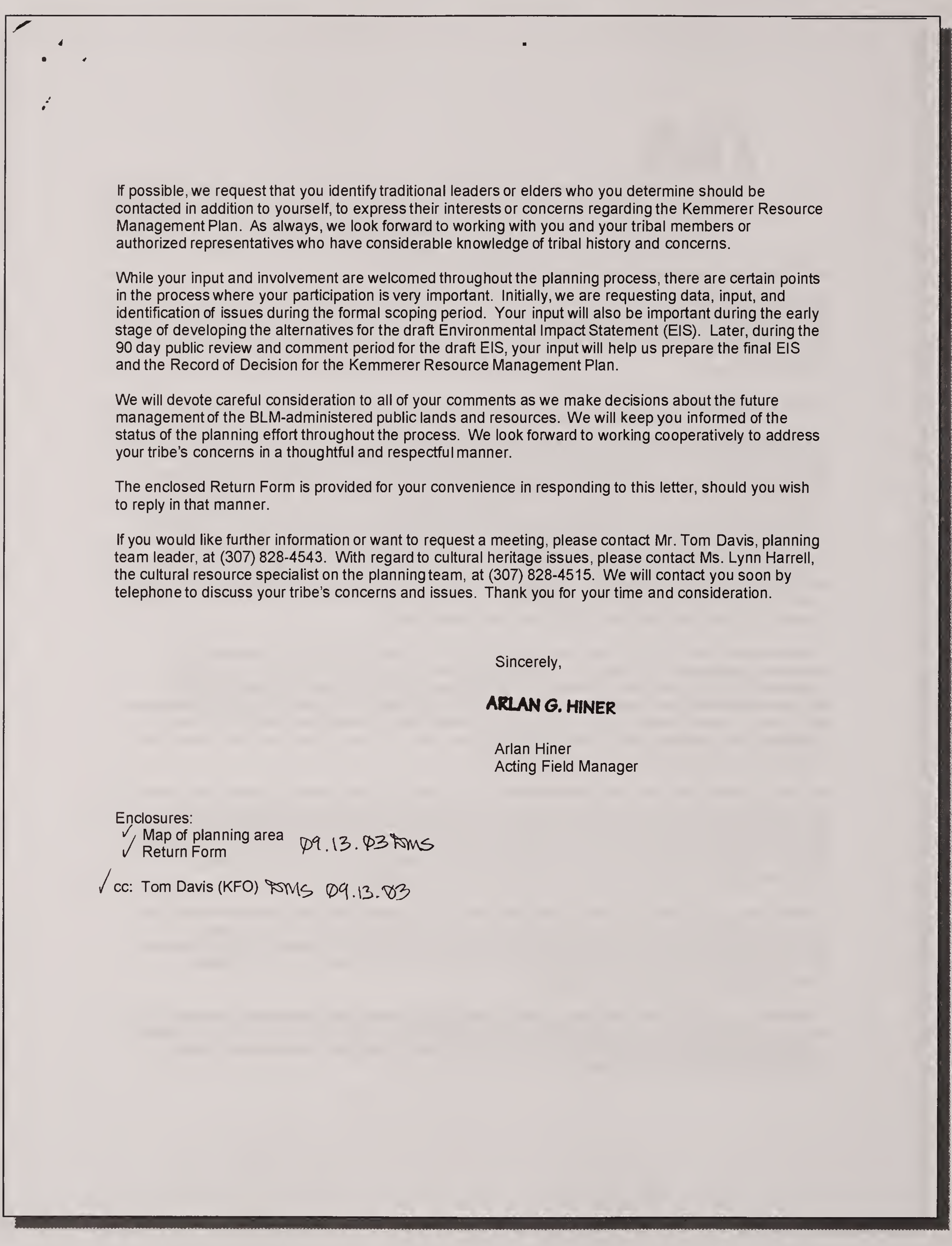

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The enclosed Return Form is provided for your convenience in responding to this letter, should you wish to reply in that manner.

If you would like further information or want to request a meeting, please contact Mr. Tom Davis, planning team leader, at (307) 828-4543. With regard to cultural heritage issues, please contact Ms. Lynn Harrell, the cultural resource specialist on the planning team, at (307) 828-4515. We will contact you soon by telephone to discuss your tribe's concerns and issues. Thank you for your time and consideration.

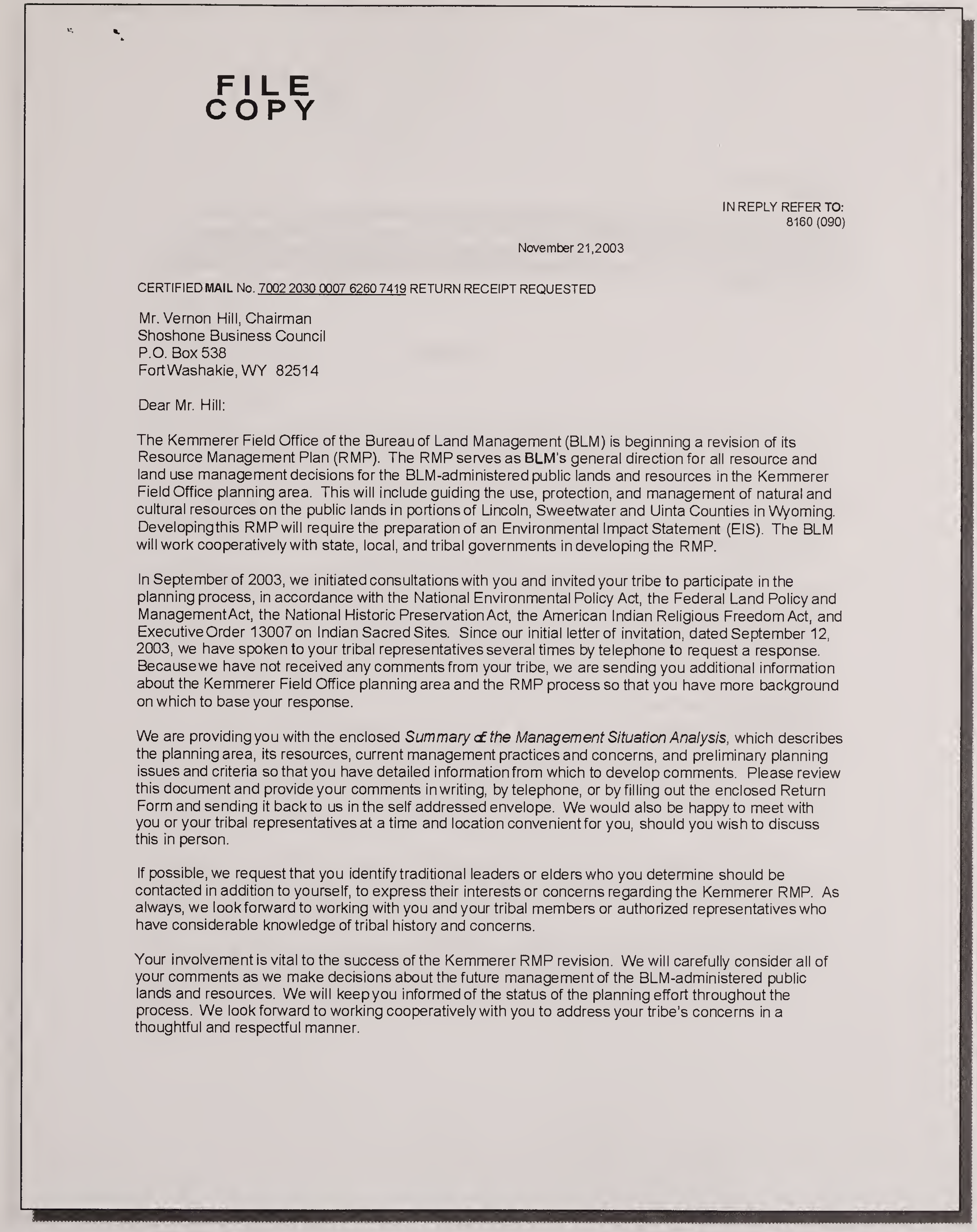
Sincerely,

ARLAN G. HINER

Arlan Hiner
Acting Field Manager

Enclosures:
✓ Map of planning area
✓ Return Form 09.13.03 RMS

✓ cc: Tom Davis (KFO) RMS 09.13.03



FILE COPY

IN REPLY REFER TO:
8160 (090)

November 21, 2003

CERTIFIED MAIL No. 7002 2030 0007 6260 7419 RETURN RECEIPT REQUESTED

Mr. Vernon Hill, Chairman
Shoshone Business Council
P.O. Box 538
Fort Washakie, WY 82514

Dear Mr. Hill:

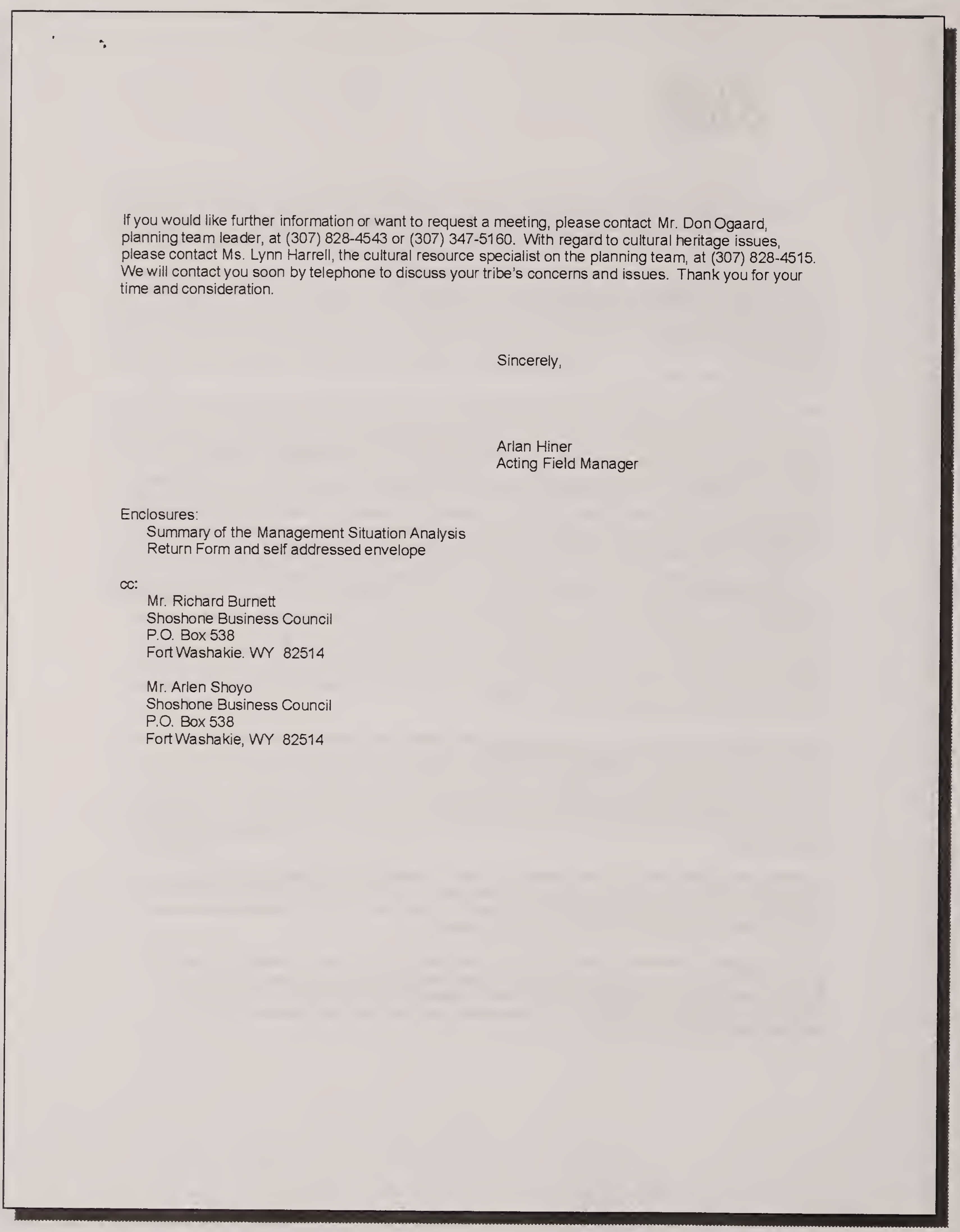
The Kemmerer Field Office of the Bureau of Land Management (BLM) is beginning a revision of its Resource Management Plan (RMP). The RMP serves as BLM's general direction for all resource and land use management decisions for the BLM-administered public lands and resources in the Kemmerer Field Office planning area. This will include guiding the use, protection, and management of natural and cultural resources on the public lands in portions of Lincoln, Sweetwater and Uinta Counties in Wyoming. Developing this RMP will require the preparation of an Environmental Impact Statement (EIS). The BLM will work cooperatively with state, local, and tribal governments in developing the RMP.

In September of 2003, we initiated consultations with you and invited your tribe to participate in the planning process, in accordance with the National Environmental Policy Act, the Federal Land Policy and Management Act, the National Historic Preservation Act, the American Indian Religious Freedom Act, and Executive Order 13007 on Indian Sacred Sites. Since our initial letter of invitation, dated September 12, 2003, we have spoken to your tribal representatives several times by telephone to request a response. Because we have not received any comments from your tribe, we are sending you additional information about the Kemmerer Field Office planning area and the RMP process so that you have more background on which to base your response.

We are providing you with the enclosed *Summary of the Management Situation Analysis*, which describes the planning area, its resources, current management practices and concerns, and preliminary planning issues and criteria so that you have detailed information from which to develop comments. Please review this document and provide your comments in writing, by telephone, or by filling out the enclosed Return Form and sending it back to us in the self addressed envelope. We would also be happy to meet with you or your tribal representatives at a time and location convenient for you, should you wish to discuss this in person.

If possible, we request that you identify traditional leaders or elders who you determine should be contacted in addition to yourself, to express their interests or concerns regarding the Kemmerer RMP. As always, we look forward to working with you and your tribal members or authorized representatives who have considerable knowledge of tribal history and concerns.

Your involvement is vital to the success of the Kemmerer RMP revision. We will carefully consider all of your comments as we make decisions about the future management of the BLM-administered public lands and resources. We will keep you informed of the status of the planning effort throughout the process. We look forward to working cooperatively with you to address your tribe's concerns in a thoughtful and respectful manner.



If you would like further information or want to request a meeting, please contact Mr. Don Ogaard, planning team leader, at (307) 828-4543 or (307) 347-5160. With regard to cultural heritage issues, please contact Ms. Lynn Harrell, the cultural resource specialist on the planning team, at (307) 828-4515. We will contact you soon by telephone to discuss your tribe's concerns and issues. Thank you for your time and consideration.

Sincerely,

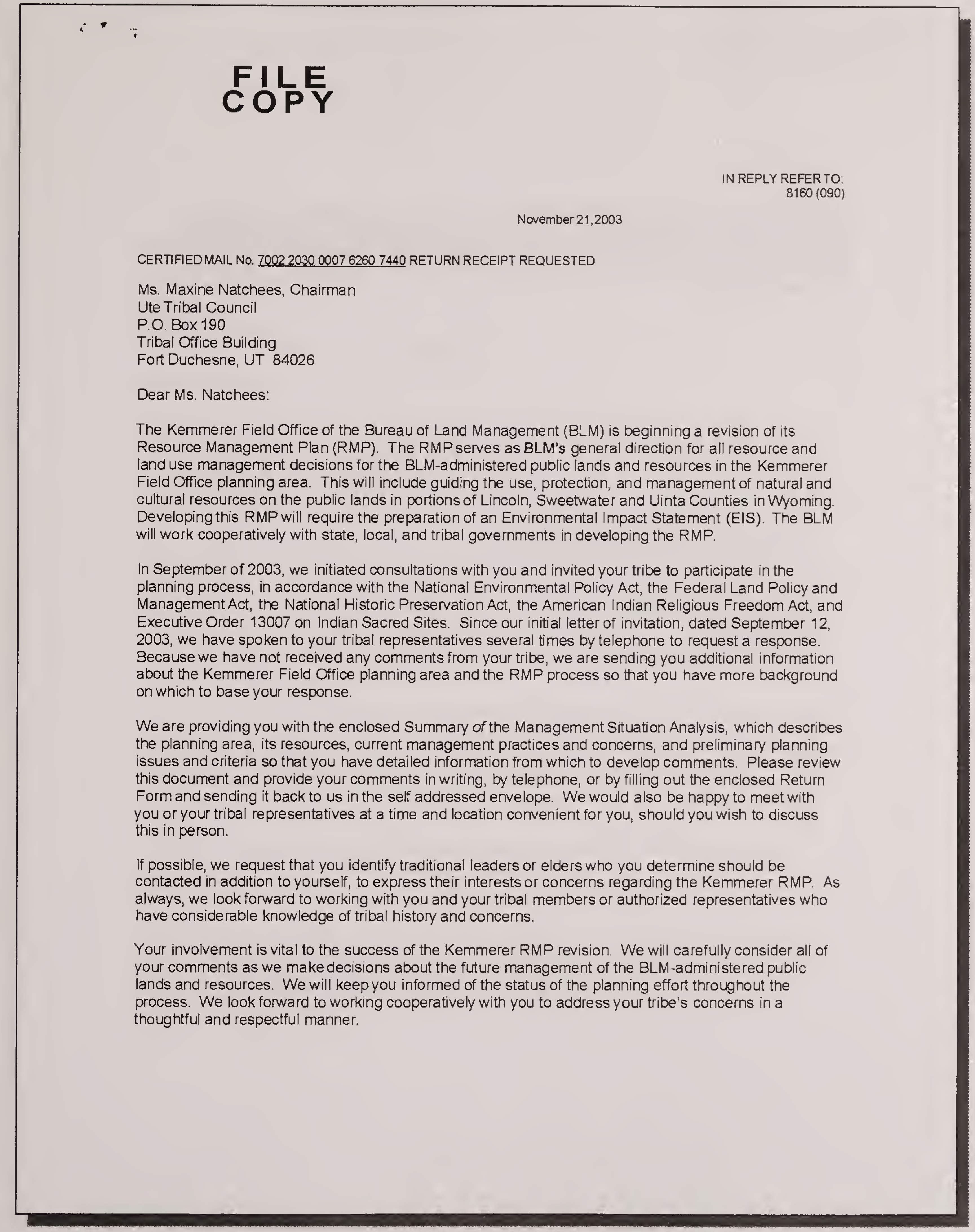
Arlan Hiner
Acting Field Manager

Enclosures:
- Summary of the Management Situation Analysis
- Return Form and self addressed envelope

cc:

Mr. Richard Burnett
Shoshone Business Council
P.O. Box 538
Fort Washakie. WY 82514

Mr. Arlen Shoyo
Shoshone Business Council
P.O. Box 538
Fort Washakie, WY 82514



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IN REPLY REFER TO:
8160 (090)

November 21, 2003

CERTIFIED MAIL No. 7002 2030 0007 6260 7440 RETURN RECEIPT REQUESTED

Ms. Maxine Natchees, Chairman
Ute Tribal Council
P.O. Box 190
Tribal Office Building
Fort Duchesne, UT 84026

Dear Ms. Natchees:

The Kemmerer Field Office of the Bureau of Land Management (BLM) is beginning a revision of its Resource Management Plan (RMP). The RMP serves as BLM's general direction for all resource and land use management decisions for the BLM-administered public lands and resources in the Kemmerer Field Office planning area. This will include guiding the use, protection, and management of natural and cultural resources on the public lands in portions of Lincoln, Sweetwater and Uinta Counties in Wyoming. Developing this RMP will require the preparation of an Environmental Impact Statement (EIS). The BLM will work cooperatively with state, local, and tribal governments in developing the RMP.

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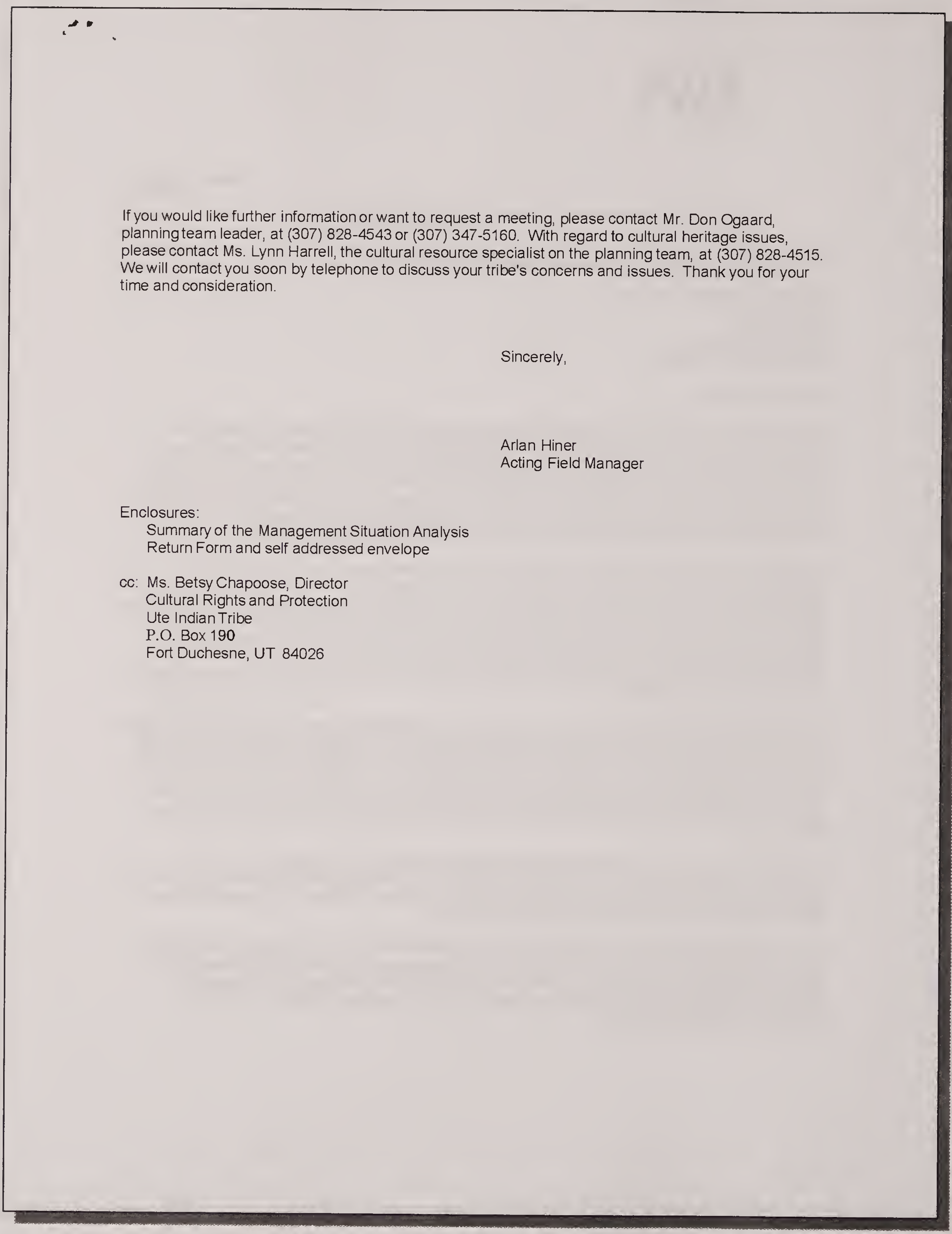
We are providing you with the enclosed Summary *of* the Management Situation Analysis, which describes the planning area, its resources, current management practices and concerns, and preliminary planning issues and criteria so that you have detailed information from which to develop comments. Please review this document and provide your comments in writing, by telephone, or by filling out the enclosed Return Form and sending it back to us in the self addressed envelope. We would also be happy to meet with you or your tribal representatives at a time and location convenient for you, should you wish to discuss this in person.

If possible, we request that you identify traditional leaders or elders who you determine should be contacted in addition to yourself, to express their interests or concerns regarding the Kemmerer RMP. As always, we look forward to working with you and your tribal members or authorized representatives who have considerable knowledge of tribal history and concerns.

Your involvement is vital to the success of the Kemmerer RMP revision. We will carefully consider all of your comments as we make decisions about the future management of the BLM-administered public lands and resources. We will keep you informed of the status of the planning effort throughout the process. We look forward to working cooperatively with you to address your tribe's concerns in a thoughtful and respectful manner.



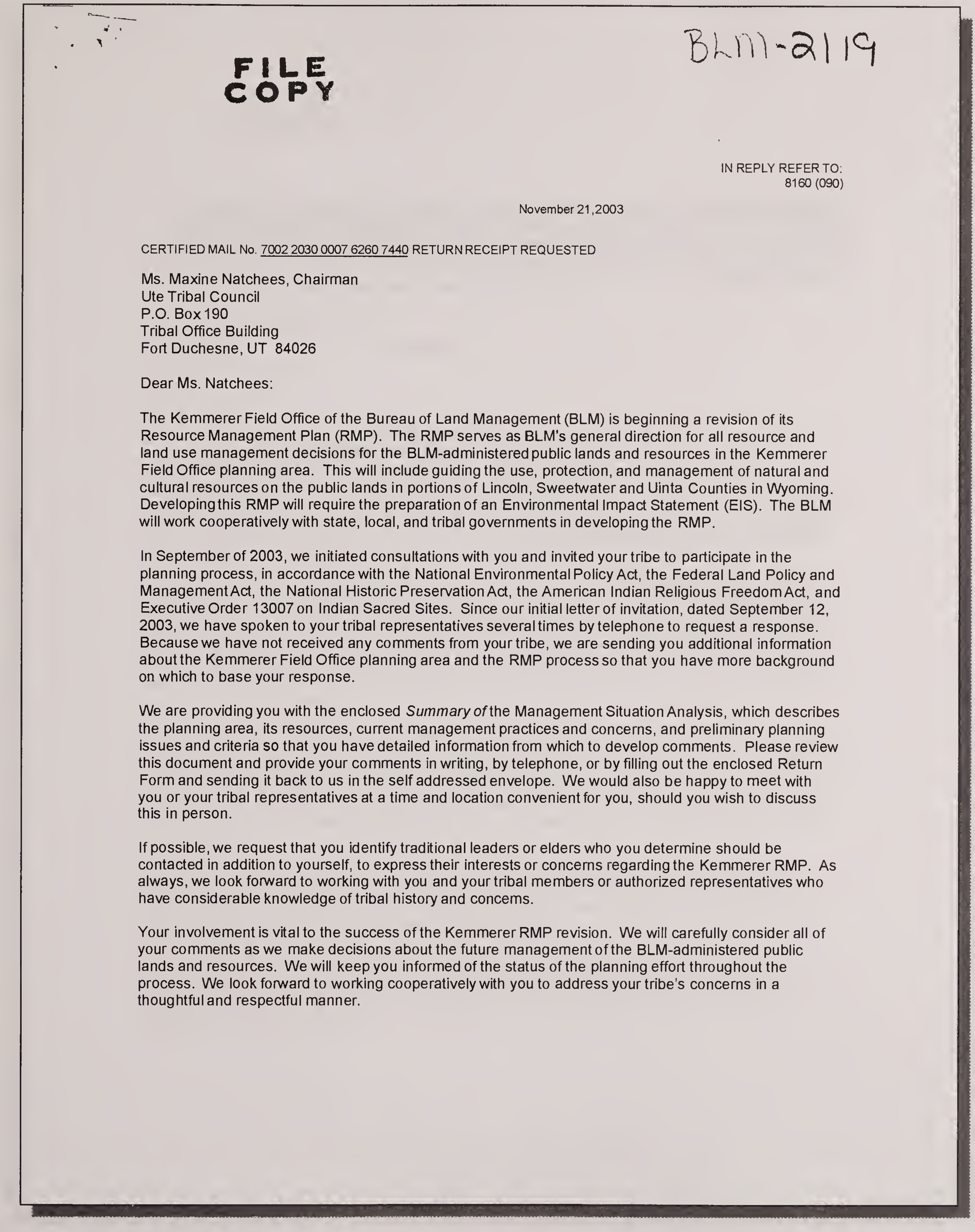
If you would like further information or want to request a meeting, please contact Mr. Don Ogaard, planning team leader, at (307) 828-4543 or (307) 347-5160. With regard to cultural heritage issues, please contact Ms. Lynn Harrell, the cultural resource specialist on the planning team, at (307) 828-4515. We will contact you soon by telephone to discuss your tribe's concerns and issues. Thank you for your time and consideration.

Sincerely,

Arlan Hiner
Acting Field Manager

Enclosures:
Summary of the Management Situation Analysis
Return Form and self addressed envelope

cc: Ms. Betsy Chapoose, Director
Cultural Rights and Protection
Ute Indian Tribe
P.O. Box 190
Fort Duchesne, UT 84026



BLM-2119

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IN REPLY REFER TO:
8160 (090)

November 21,2003

CERTIFIED MAIL No. 7002 2030 0007 6260 7440 RETURN RECEIPT REQUESTED

Ms. Maxine Natchees, Chairman
Ute Tribal Council
P.O. Box 190
Tribal Office Building
Fort Duchesne, UT 84026

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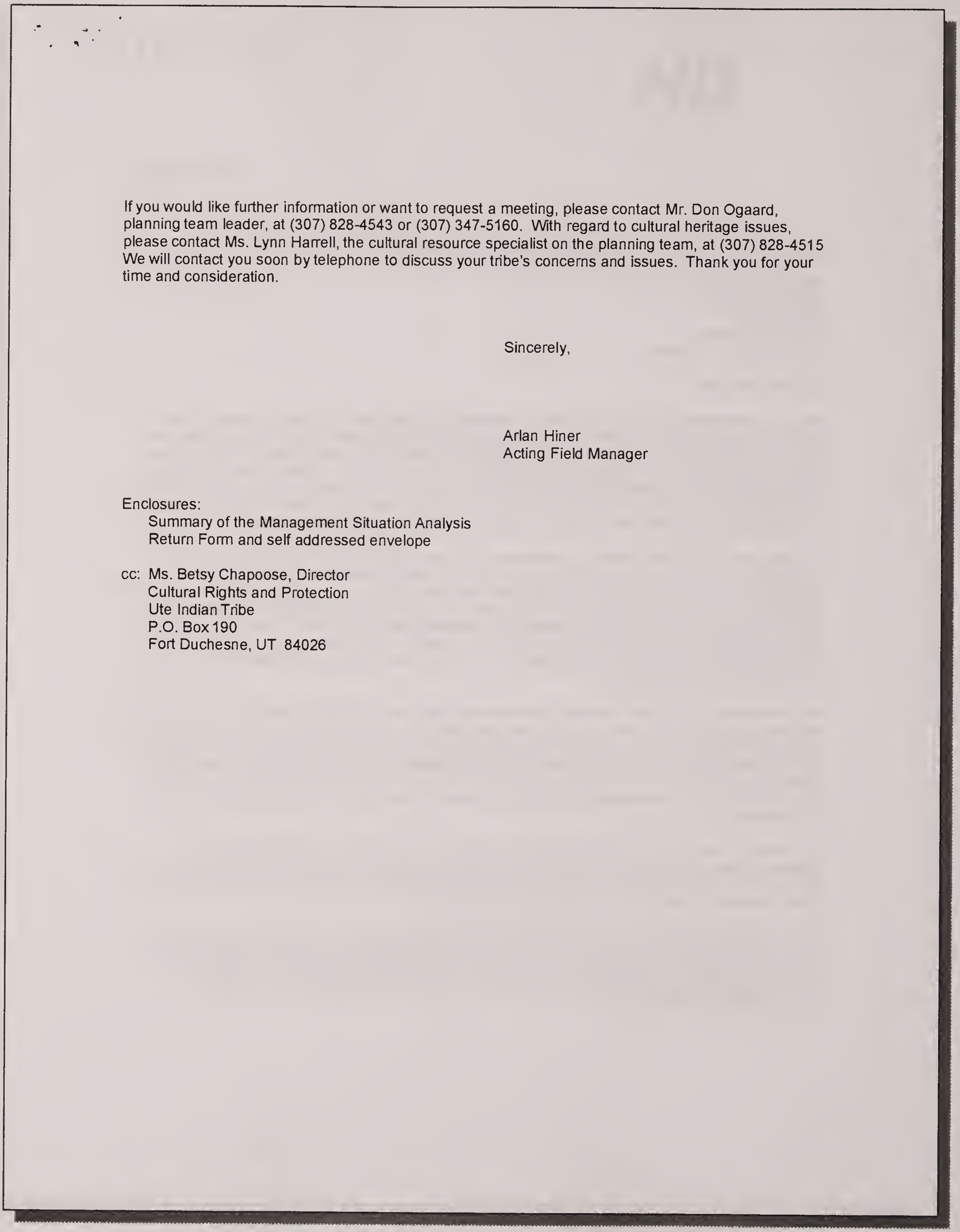
If possible, we request that you identify traditional leaders or elders who you determine should be contacted in addition to yourself, to express their interests or concerns regarding the Kemmerer RMP. As always, we look forward to working with you and your tribal members or authorized representatives who have considerable knowledge of tribal history and concerns.

Your involvement is vital to the success of the Kemmerer RMP revision. We will carefully consider all of your comments as we make decisions about the future management of the BLM-administered public lands and resources. We will keep you informed of the status of the planning effort throughout the process. We look forward to working cooperatively with you to address your tribe's concerns in a thoughtful and respectful manner.



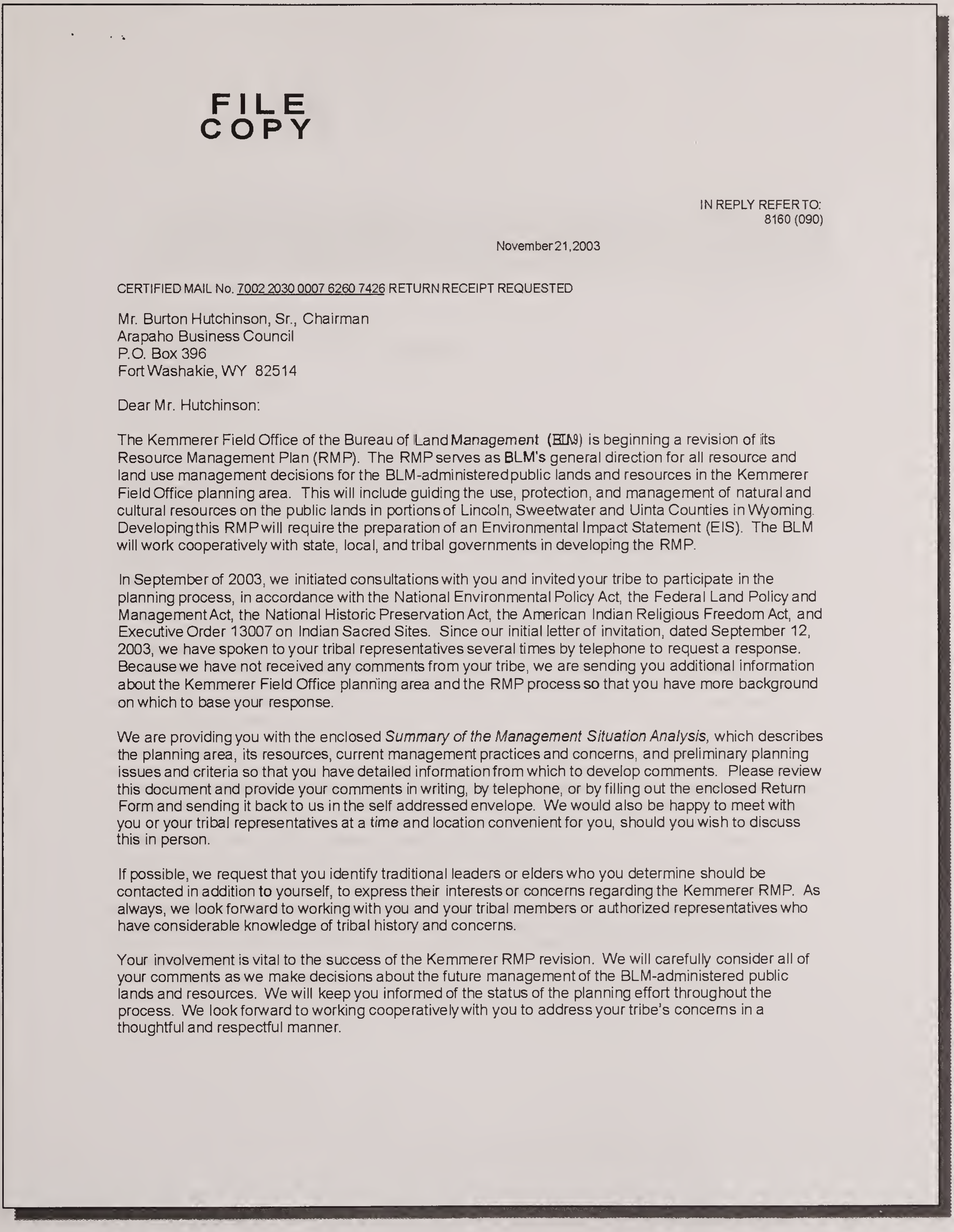
If you would like further information or want to request a meeting, please contact Mr. Don Ogaard, planning team leader, at (307) 828-4543 or (307) 347-5160. With regard to cultural heritage issues, please contact Ms. Lynn Harrell, the cultural resource specialist on the planning team, at (307) 828-4515 We will contact you soon by telephone to discuss your tribe's concerns and issues. Thank you for your time and consideration.

Sincerely,

Arlan Hiner
Acting Field Manager

Enclosures:
Summary of the Management Situation Analysis
Return Form and self addressed envelope

cc: Ms. Betsy Chapoose, Director
Cultural Rights and Protection
Ute Indian Tribe
P.O. Box 190
Fort Duchesne, UT 84026



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IN REPLY REFER TO:
8160 (090)

November 21, 2003

CERTIFIED MAIL No. 7002 2030 0007 6260 7426 RETURN RECEIPT REQUESTED

Mr. Burton Hutchinson, Sr., Chairman
Arapaho Business Council
P.O. Box 396
Fort Washakie, WY 82514

Dear Mr. Hutchinson:

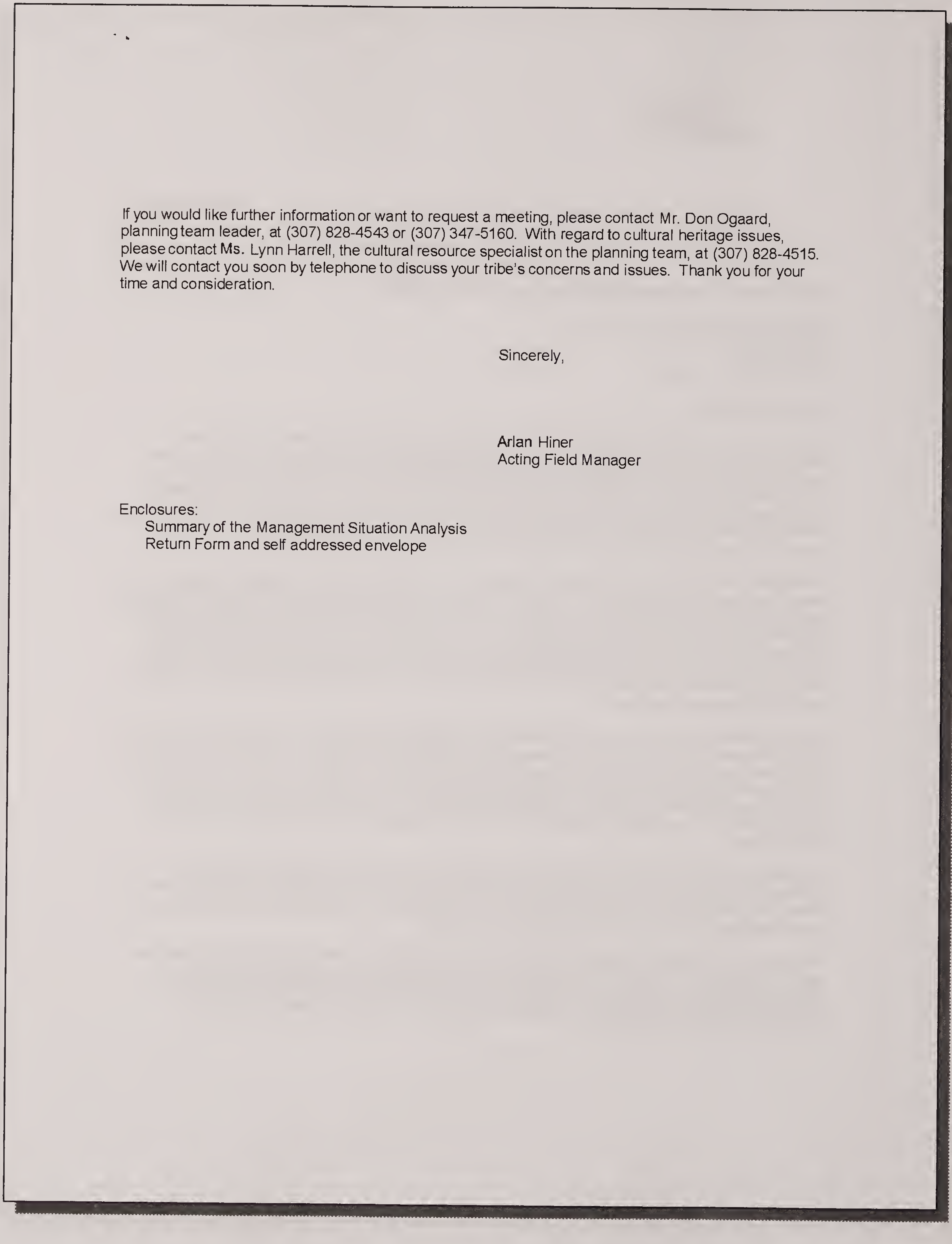
The Kemmerer Field Office of the Bureau of Land Management (BLM) is beginning a revision of its Resource Management Plan (RMP). The RMP serves as BLM's general direction for all resource and land use management decisions for the BLM-administered public lands and resources in the Kemmerer Field Office planning area. This will include guiding the use, protection, and management of natural and cultural resources on the public lands in portions of Lincoln, Sweetwater and Uinta Counties in Wyoming. Developing this RMP will require the preparation of an Environmental Impact Statement (EIS). The BLM will work cooperatively with state, local, and tribal governments in developing the RMP.

In September of 2003, we initiated consultations with you and invited your tribe to participate in the planning process, in accordance with the National Environmental Policy Act, the Federal Land Policy and Management Act, the National Historic Preservation Act, the American Indian Religious Freedom Act, and Executive Order 13007 on Indian Sacred Sites. Since our initial letter of invitation, dated September 12, 2003, we have spoken to your tribal representatives several times by telephone to request a response. Because we have not received any comments from your tribe, we are sending you additional information about the Kemmerer Field Office planning area and the RMP process so that you have more background on which to base your response.

We are providing you with the enclosed *Summary of the Management Situation Analysis,* which describes the planning area, its resources, current management practices and concerns, and preliminary planning issues and criteria so that you have detailed information from which to develop comments. Please review this document and provide your comments in writing, by telephone, or by filling out the enclosed Return Form and sending it back to us in the self addressed envelope. We would also be happy to meet with you or your tribal representatives at a time and location convenient for you, should you wish to discuss this in person.

If possible, we request that you identify traditional leaders or elders who you determine should be contacted in addition to yourself, to express their interests or concerns regarding the Kemmerer RMP. As always, we look forward to working with you and your tribal members or authorized representatives who have considerable knowledge of tribal history and concerns.

Your involvement is vital to the success of the Kemmerer RMP revision. We will carefully consider all of your comments as we make decisions about the future management of the BLM-administered public lands and resources. We will keep you informed of the status of the planning effort throughout the process. We look forward to working cooperatively with you to address your tribe's concerns in a thoughtful and respectful manner.

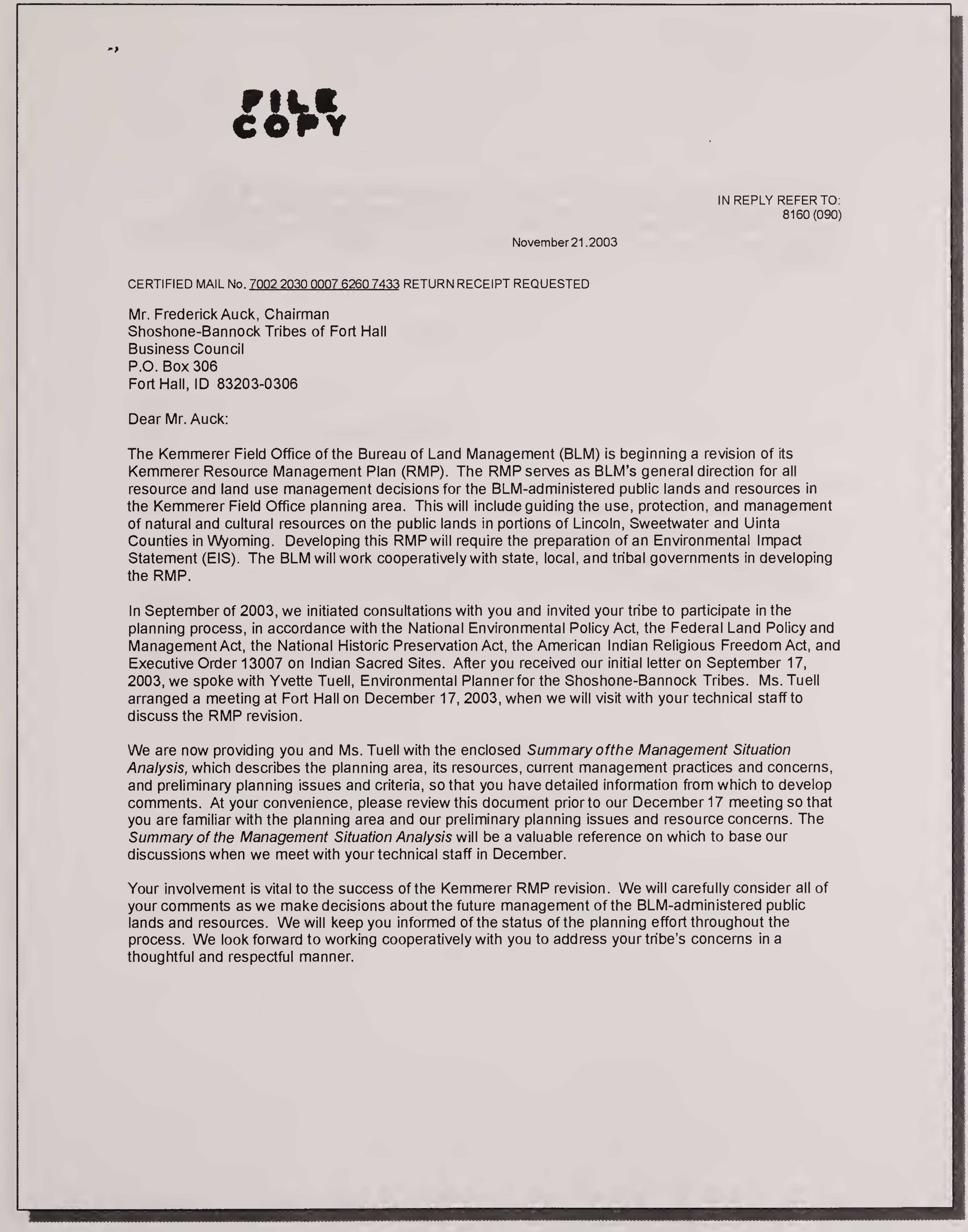


If you would like further information or want to request a meeting, please contact Mr. Don Ogaard, planning team leader, at (307) 828-4543 or (307) 347-5160. With regard to cultural heritage issues, please contact Ms. Lynn Harrell, the cultural resource specialist on the planning team, at (307) 828-4515. We will contact you soon by telephone to discuss your tribe's concerns and issues. Thank you for your time and consideration.

Sincerely,

Arlan Hiner
Acting Field Manager

Enclosures:
- Summary of the Management Situation Analysis
- Return Form and self addressed envelope



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IN REPLY REFER TO:
8160 (090)

November 21.2003

CERTIFIED MAIL No. 7002 2030 0007 6260 7433 RETURN RECEIPT REQUESTED

Mr. Frederick Auck, Chairman
Shoshone-Bannock Tribes of Fort Hall
Business Council
P.O. Box 306
Fort Hall, ID 83203-0306

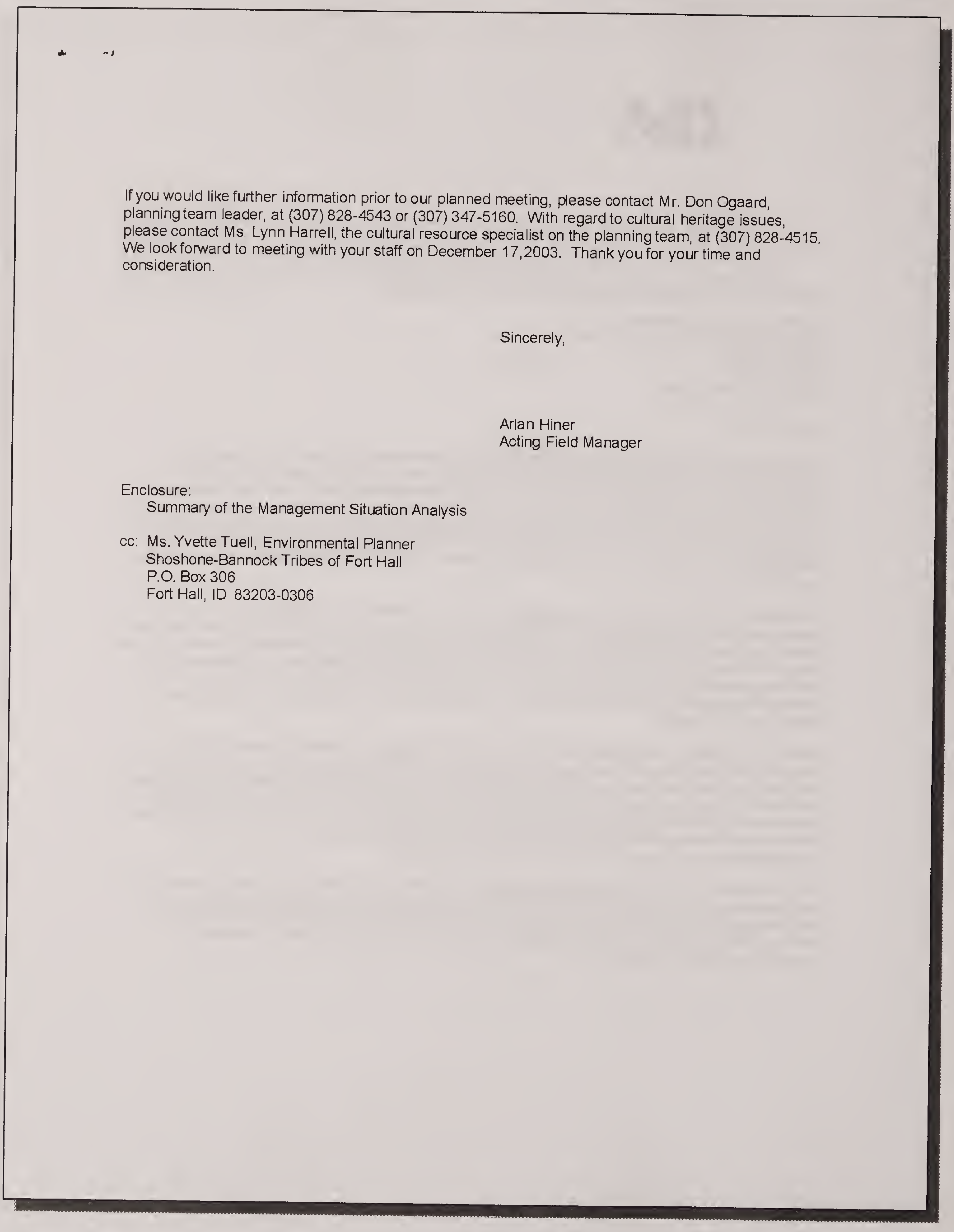
Dear Mr. Auck:

The Kemmerer Field Office of the Bureau of Land Management (BLM) is beginning a revision of its Kemmerer Resource Management Plan (RMP). The RMP serves as BLM's general direction for all resource and land use management decisions for the BLM-administered public lands and resources in the Kemmerer Field Office planning area. This will include guiding the use, protection, and management of natural and cultural resources on the public lands in portions of Lincoln, Sweetwater and Uinta Counties in Wyoming. Developing this RMP will require the preparation of an Environmental Impact Statement (EIS). The BLM will work cooperatively with state, local, and tribal governments in developing the RMP.

In September of 2003, we initiated consultations with you and invited your tribe to participate in the planning process, in accordance with the National Environmental Policy Act, the Federal Land Policy and Management Act, the National Historic Preservation Act, the American Indian Religious Freedom Act, and Executive Order 13007 on Indian Sacred Sites. After you received our initial letter on September 17, 2003, we spoke with Yvette Tuell, Environmental Planner for the Shoshone-Bannock Tribes. Ms. Tuell arranged a meeting at Fort Hall on December 17, 2003, when we will visit with your technical staff to discuss the RMP revision.

We are now providing you and Ms. Tuell with the enclosed *Summary of the Management Situation Analysis,* which describes the planning area, its resources, current management practices and concerns, and preliminary planning issues and criteria, so that you have detailed information from which to develop comments. At your convenience, please review this document prior to our December 17 meeting so that you are familiar with the planning area and our preliminary planning issues and resource concerns. The *Summary of the Management Situation Analysis* will be a valuable reference on which to base our discussions when we meet with your technical staff in December.

Your involvement is vital to the success of the Kemmerer RMP revision. We will carefully consider all of your comments as we make decisions about the future management of the BLM-administered public lands and resources. We will keep you informed of the status of the planning effort throughout the process. We look forward to working cooperatively with you to address your tribe's concerns in a thoughtful and respectful manner.



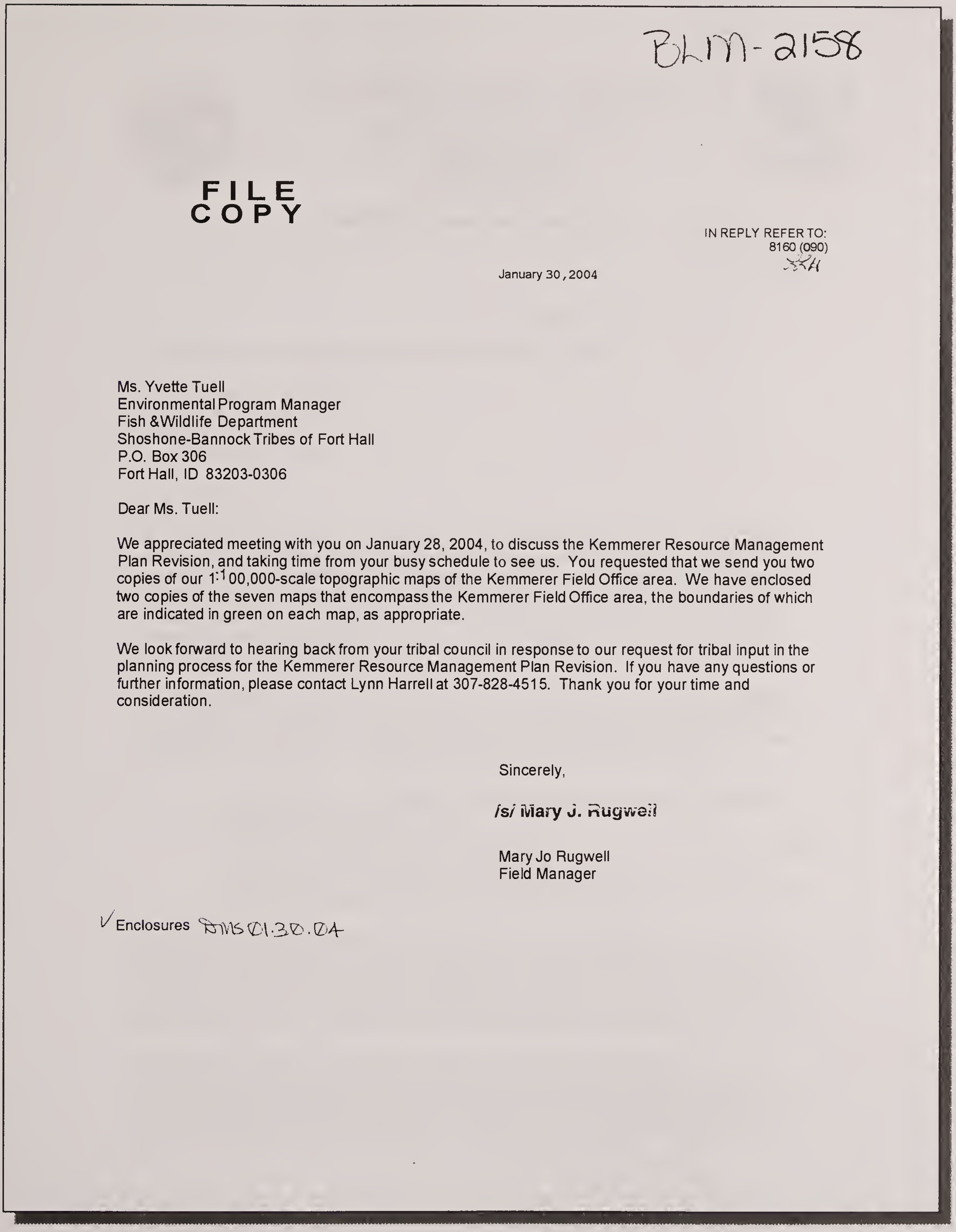
If you would like further information prior to our planned meeting, please contact Mr. Don Ogaard, planning team leader, at (307) 828-4543 or (307) 347-5160. With regard to cultural heritage issues, please contact Ms. Lynn Harrell, the cultural resource specialist on the planning team, at (307) 828-4515. We look forward to meeting with your staff on December 17,2003. Thank you for your time and consideration.

Sincerely,

Arlan Hiner
Acting Field Manager

Enclosure:
Summary of the Management Situation Analysis

cc: Ms. Yvette Tuell, Environmental Planner
Shoshone-Bannock Tribes of Fort Hall
P.O. Box 306
Fort Hall, ID 83203-0306



BLM-2158

FILE COPY

IN REPLY REFER TO:
8160 (090)

January 30, 2004

Ms. Yvette Tuell
Environmental Program Manager
Fish &Wildlife Department
Shoshone-Bannock Tribes of Fort Hall
P.O. Box 306
Fort Hall, ID 83203-0306

Dear Ms. Tuell:

We appreciated meeting with you on January 28, 2004, to discuss the Kemmerer Resource Management Plan Revision, and taking time from your busy schedule to see us. You requested that we send you two copies of our 1:100,000-scale topographic maps of the Kemmerer Field Office area. We have enclosed two copies of the seven maps that encompass the Kemmerer Field Office area, the boundaries of which are indicated in green on each map, as appropriate.

We look forward to hearing back from your tribal council in response to our request for tribal input in the planning process for the Kemmerer Resource Management Plan Revision. If you have any questions or further information, please contact Lynn Harrell at 307-828-4515. Thank you for your time and consideration.

Sincerely,

/s/ Mary J. Rugwell

Mary Jo Rugwell
Field Manager

✓ Enclosures BMS 01.30.04

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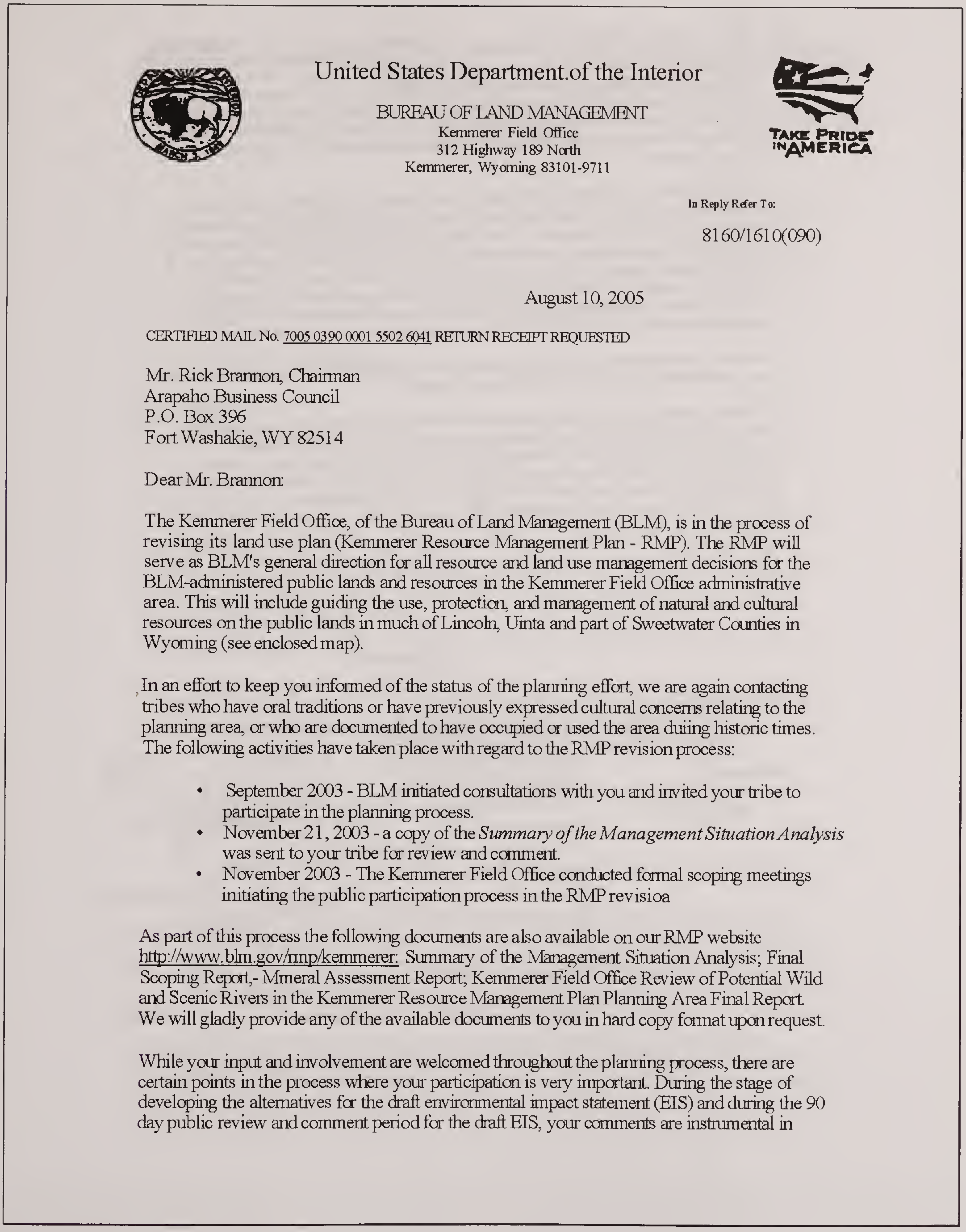


United States Department.of the Interior

BUREAU OF LAND MANAGEMENT
Kemmerer Field Office
312 Highway 189 North
Kemmerer, Wyoming 83101-9711

TAKE PRIDE IN AMERICA

In Reply Refer To:

8160/1610(090)

August 10, 2005

CERTIFIED MAIL No. 7005 0390 0001 5502 6041 RETURN RECEIPT REQUESTED

Mr. Rick Brannon, Chairman
Arapaho Business Council
P.O. Box 396
Fort Washakie, WY 82514

Dear Mr. Brannon:

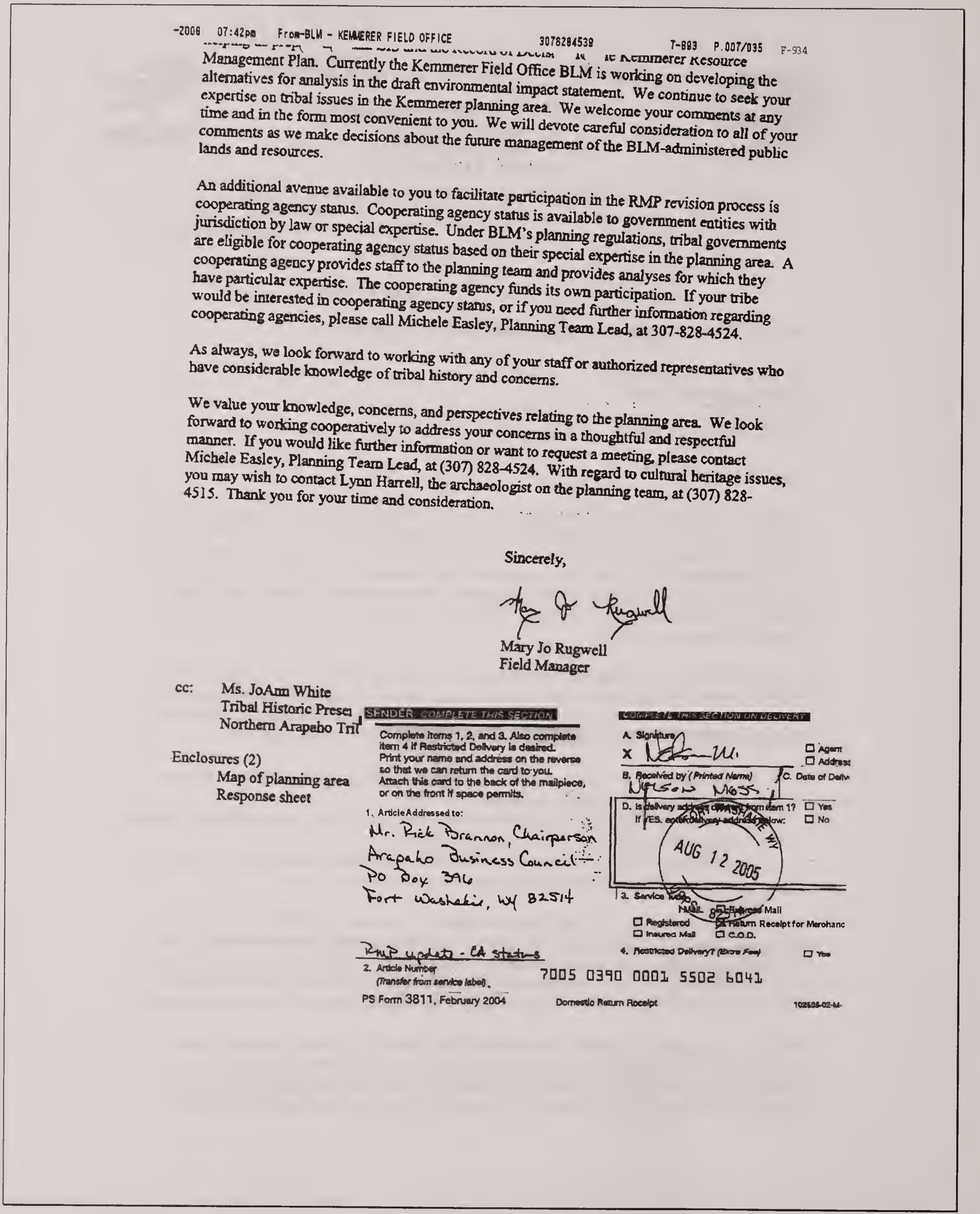
The Kemmerer Field Office, of the Bureau of Land Management (BLM), is in the process of revising its land use plan (Kemmerer Resource Management Plan - RMP). The RMP will serve as BLM's general direction for all resource and land use management decisions for the BLM-administered public lands and resources in the Kemmerer Field Office administrative area. This will include guiding the use, protection, and management of natural and cultural resources on the public lands in much of Lincoln, Uinta and part of Sweetwater Counties in Wyoming (see enclosed map).

In an effort to keep you informed of the status of the planning effort, we are again contacting tribes who have oral traditions or have previously expressed cultural concerns relating to the planning area, or who are documented to have occupied or used the area during historic times. The following activities have taken place with regard to the RMP revision process:

- September 2003 - BLM initiated consultations with you and invited your tribe to participate in the planning process.
- November 21, 2003 - a copy of the *Summary of the Management Situation Analysis* was sent to your tribe for review and comment.
- November 2003 - The Kemmerer Field Office conducted formal scoping meetings initiating the public participation process in the RMP revision

As part of this process the following documents are also available on our RMP website http://www.blm.gov/rmp/kemmerer: Summary of the Management Situation Analysis; Final Scoping Report,- Mineral Assessment Report; Kemmerer Field Office Review of Potential Wild and Scenic Rivers in the Kemmerer Resource Management Plan Planning Area Final Report. We will gladly provide any of the available documents to you in hard copy format upon request.

While your input and involvement are welcomed throughout the planning process, there are certain points in the process where your participation is very important. During the stage of developing the alternatives for the draft environmental impact statement (EIS) and during the 90 day public review and comment period for the draft EIS, your comments are instrumental in



-2006 07:42pm From-BLM - KEMMERER FIELD OFFICE 3078284538 T-893 P.007/035 F-934

[illegible] and the Record of Decis[illegible] Kemmerer Resource Management Plan. Currently the Kemmerer Field Office BLM is working on developing the alternatives for analysis in the draft environmental impact statement. We continue to seek your expertise on tribal issues in the Kemmerer planning area. We welcome your comments at any time and in the form most convenient to you. We will devote careful consideration to all of your comments as we make decisions about the future management of the BLM-administered public lands and resources.

An additional avenue available to you to facilitate participation in the RMP revision process is cooperating agency status. Cooperating agency status is available to government entities with jurisdiction by law or special expertise. Under BLM's planning regulations, tribal governments are eligible for cooperating agency status based on their special expertise in the planning area. A cooperating agency provides staff to the planning team and provides analyses for which they have particular expertise. The cooperating agency funds its own participation. If your tribe would be interested in cooperating agency status, or if you need further information regarding cooperating agencies, please call Michele Easley, Planning Team Lead, at 307-828-4524.

As always, we look forward to working with any of your staff or authorized representatives who have considerable knowledge of tribal history and concerns.

We value your knowledge, concerns, and perspectives relating to the planning area. We look forward to working cooperatively to address your concerns in a thoughtful and respectful manner. If you would like further information or want to request a meeting, please contact Michele Easley, Planning Team Lead, at (307) 828-4524. With regard to cultural heritage issues, you may wish to contact Lynn Harrell, the archaeologist on the planning team, at (307) 828-4515. Thank you for your time and consideration.

Sincerely,

Mary Jo Rugwell

Mary Jo Rugwell
Field Manager

cc: Ms. JoAnn White
Tribal Historic Prese
Northern Arapaho Tri

Enclosures (2)
Map of planning area
Response sheet

SENDER: COMPLETE THIS SECTION

Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
Print your name and address on the reverse so that we can return the card to you.
Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. Rick Brannon, Chairperson
Arapaho Business Council
PO Box 396
Fort Washakie, WY 82514

RMP update - CA status

2. Article Number
(Transfer from service label) 7005 0390 0001 5502 6041

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X ☐ Agent ☐ Address

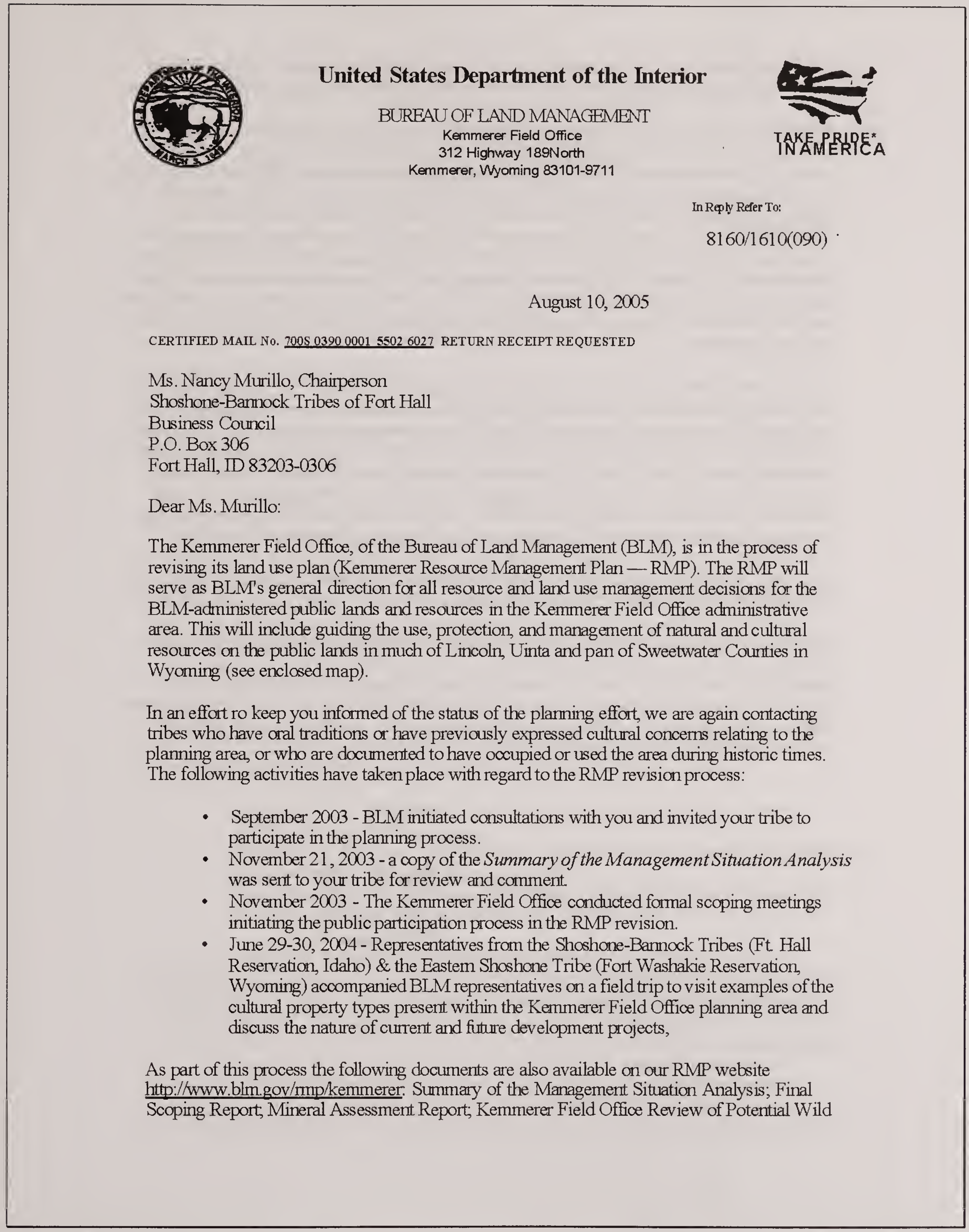
B. Received by (Printed Name) C. Date of Deliv
Nelson Moss

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

FORT WASHAKIE WY
AUG 12 2005
82514

3. Service Type
Mail ☐ Express Mail
☐ Registered ☒ Return Receipt for Merchanc
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes



United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Kemmerer Field Office
312 Highway 189North
Kemmerer, Wyoming 83101-9711

TAKE PRIDE*
IN AMERICA

In Reply Refer To:

8160/1610(090)

August 10, 2005

CERTIFIED MAIL No. 7005 0390 0001 5502 6027 RETURN RECEIPT REQUESTED

Ms. Nancy Murillo, Chairperson
Shoshone-Bannock Tribes of Fort Hall
Business Council
P.O. Box 306
Fort Hall, ID 83203-0306

Dear Ms. Murillo:

The Kemmerer Field Office, of the Bureau of Land Management (BLM), is in the process of revising its land use plan (Kemmerer Resource Management Plan — RMP). The RMP will serve as BLM's general direction for all resource and land use management decisions for the BLM-administered public lands and resources in the Kemmerer Field Office administrative area. This will include guiding the use, protection, and management of natural and cultural resources on the public lands in much of Lincoln, Uinta and pan of Sweetwater Counties in Wyoming (see enclosed map).

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- September 2003 - BLM initiated consultations with you and invited your tribe to participate in the planning process.
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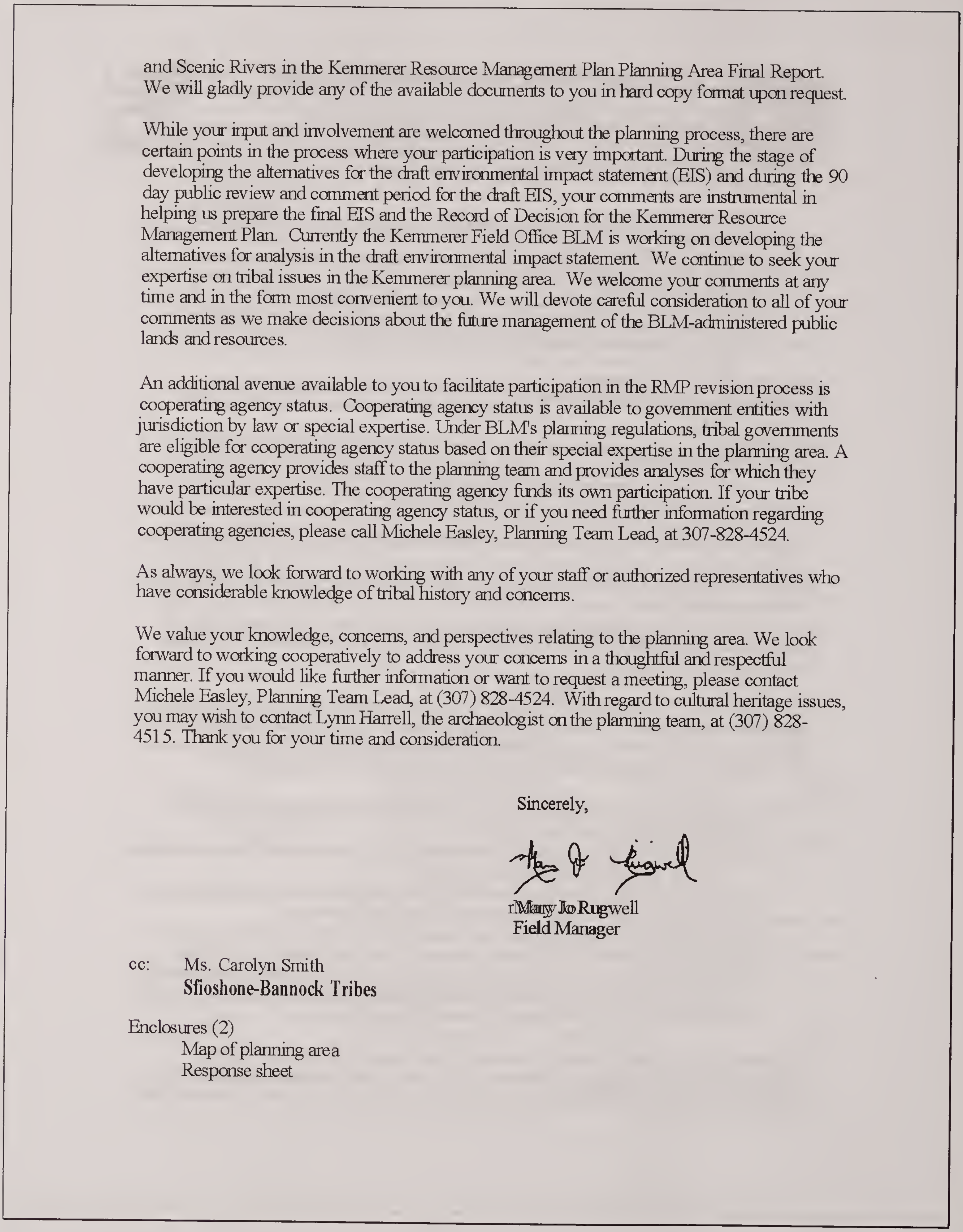

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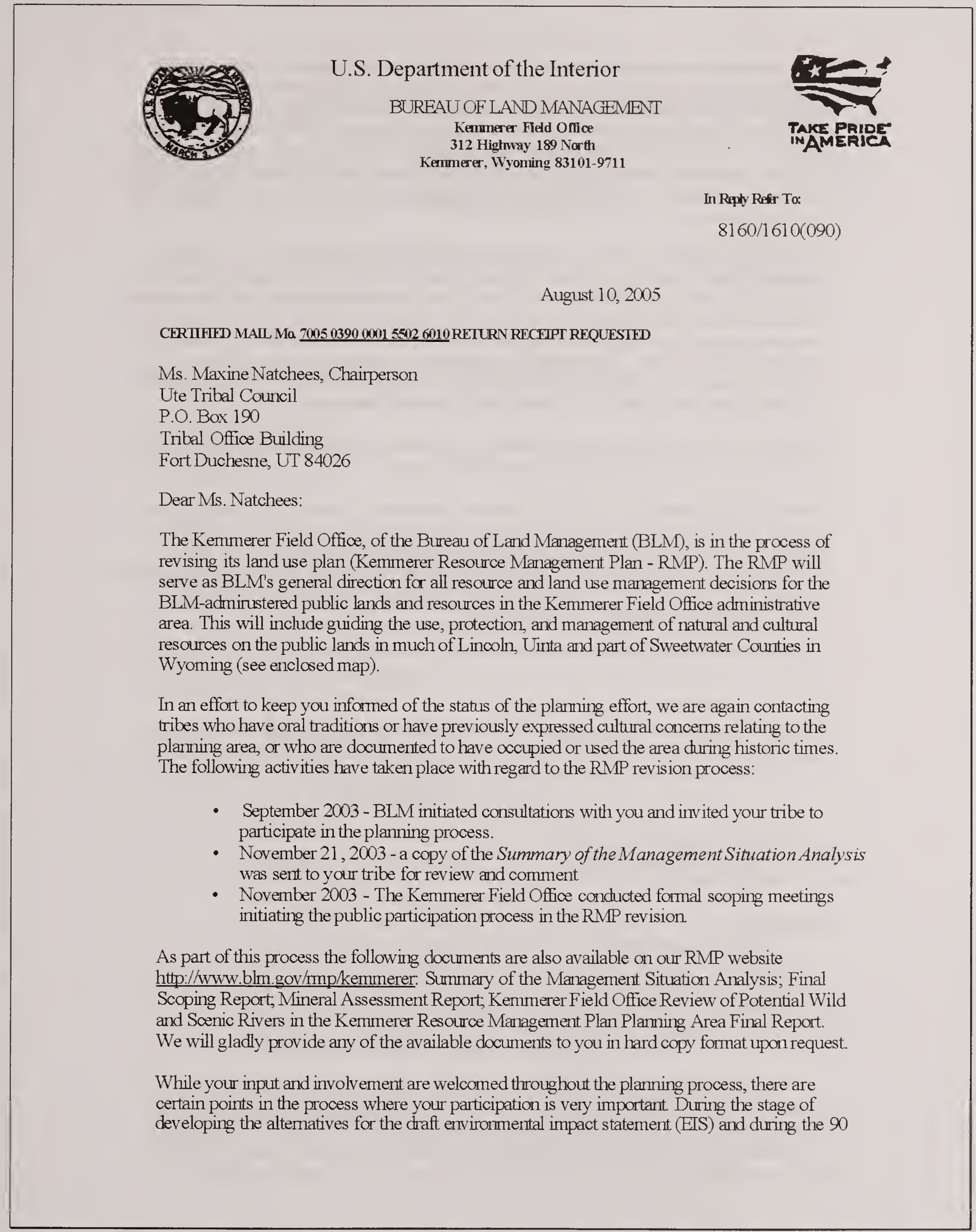
Sincerely,

Mary Jo Rugwell
Field Manager

cc: Ms. Carolyn Smith
Shoshone-Bannock Tribes

Enclosures (2)
Map of planning area
Response sheet



U.S. Department of the Interior

BUREAU OF LAND MANAGEMENT
Kemmerer Field Office
312 Highway 189 North
Kemmerer, Wyoming 83101-9711

In Reply Refer To:
8160/1610(090)

August 10, 2005

CERTIFIED MAIL No. 7005 0390 0001 5502 6010 RETURN RECEIPT REQUESTED

Ms. Maxine Natchees, Chairperson
Ute Tribal Council
P.O. Box 190
Tribal Office Building
Fort Duchesne, UT 84026

Dear Ms. Natchees:

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Mary Jo Rugwell
Field Manager

cc: Ms. Betsy Chapoose, Director
Cultural Rights and Protection
Ute Indian Tribe

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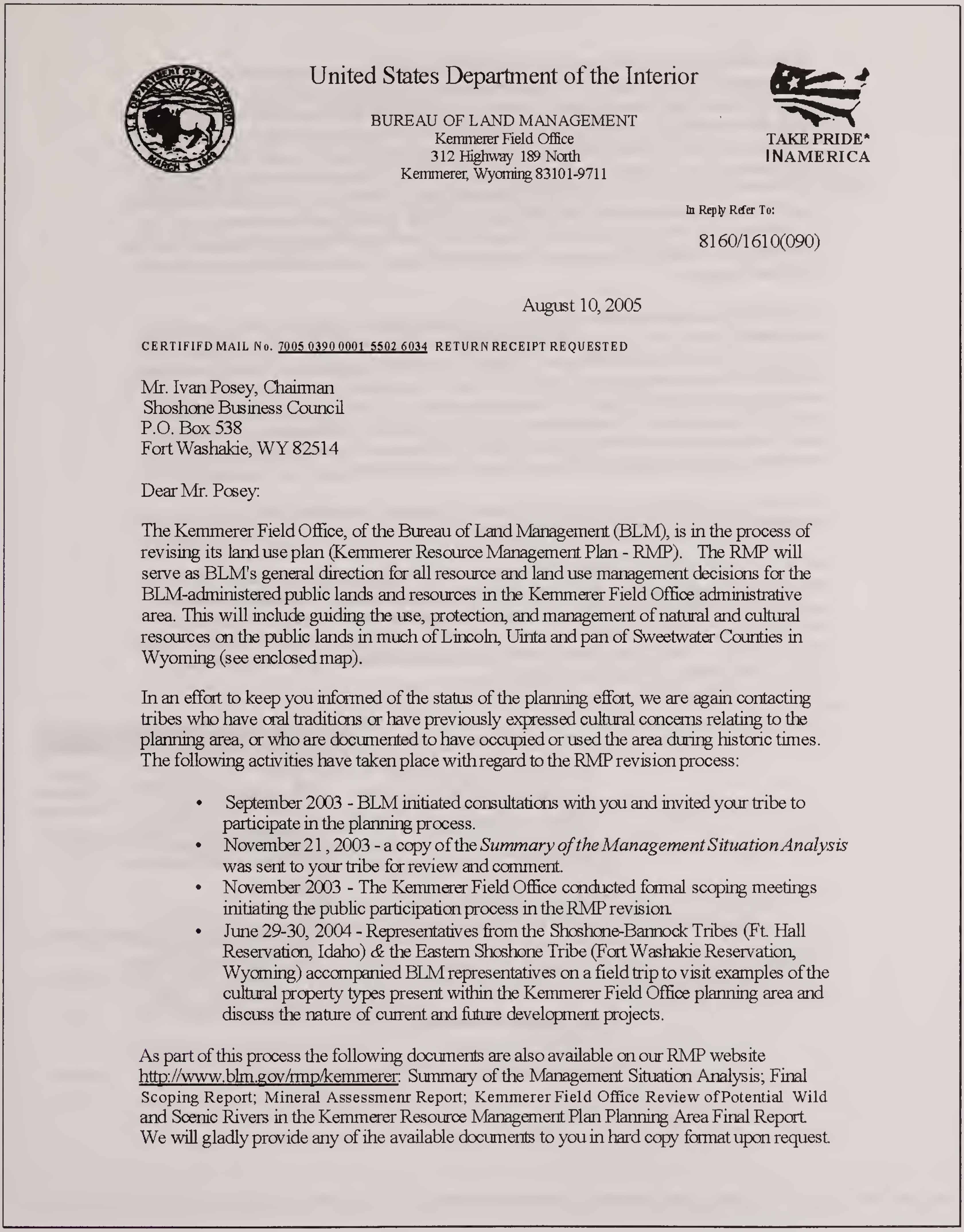

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Kemmerer Field Office
312 Highway 189 North
Kemmerer, Wyoming 83101-9711

TAKE PRIDE*
INAMERICA

In Reply Refer To:

8160/1610(090)

August 10, 2005

CERTIFIFD MAIL No. 7005 0390 0001 5502 6034 RETURN RECEIPT REQUESTED

Mr. Ivan Posey, Chairman
Shoshone Business Council
P.O. Box 538
Fort Washakie, WY 82514

Dear Mr. Posey:

The Kemmerer Field Office, of the Bureau of Land Management (BLM), is in the process of revising its land use plan (Kemmerer Resource Management Plan - RMP). The RMP will serve as BLM's general direction for all resource and land use management decisions for the BLM-administered public lands and resources in the Kemmerer Field Office administrative area. This will include guiding the use, protection, and management of natural and cultural resources on the public lands in much of Lincoln, Uinta and pan of Sweetwater Counties in Wyoming (see enclosed map).

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cc: Arlen Shoyo
Shoshone Business Co

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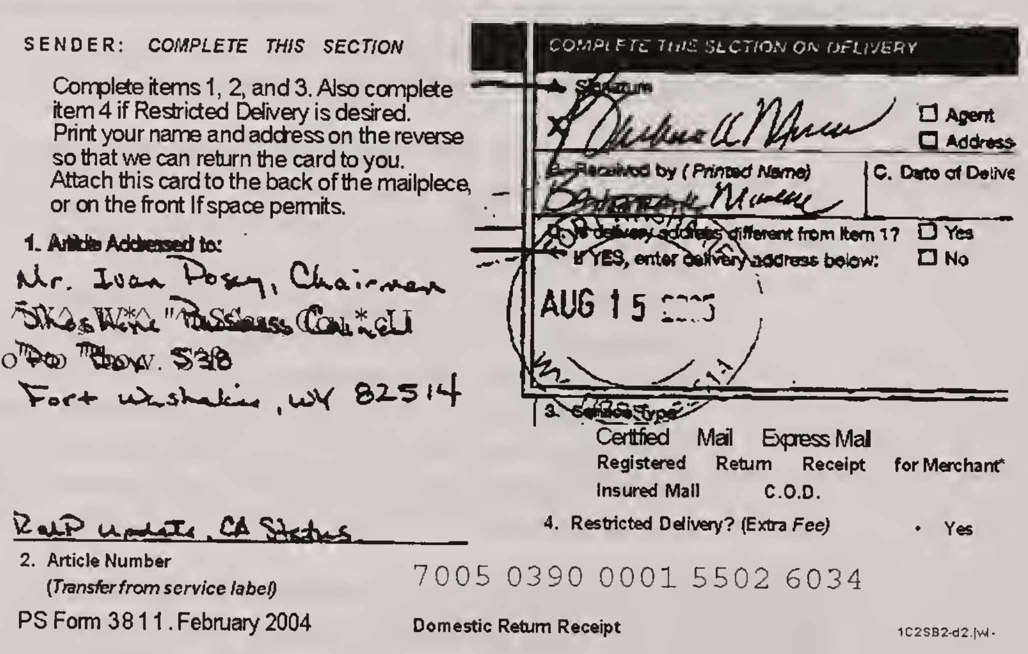


SENDER: *COMPLETE THIS SECTION*

Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
Print your name and address on the reverse so that we can return the card to you.
Attach this card to the back of the mailpiece, or on the front If space permits.

1. Article Addressed to:
Mr. Ivan Posey, Chairman
Shoshone Business Council
P.O. Box. 538
Fort Washakie, WY 82514

RMP update, CA Status

2. Article Number
(*Transfer from service label*) 7005 0390 0001 5502 6034

PS Form 3811. February 2004 Domestic Return Receipt 1C2SB2-d2.|W-

COMPLETE THIS SECTION ON DELIVERY

A. Signature
☐ Agent
☐ Address

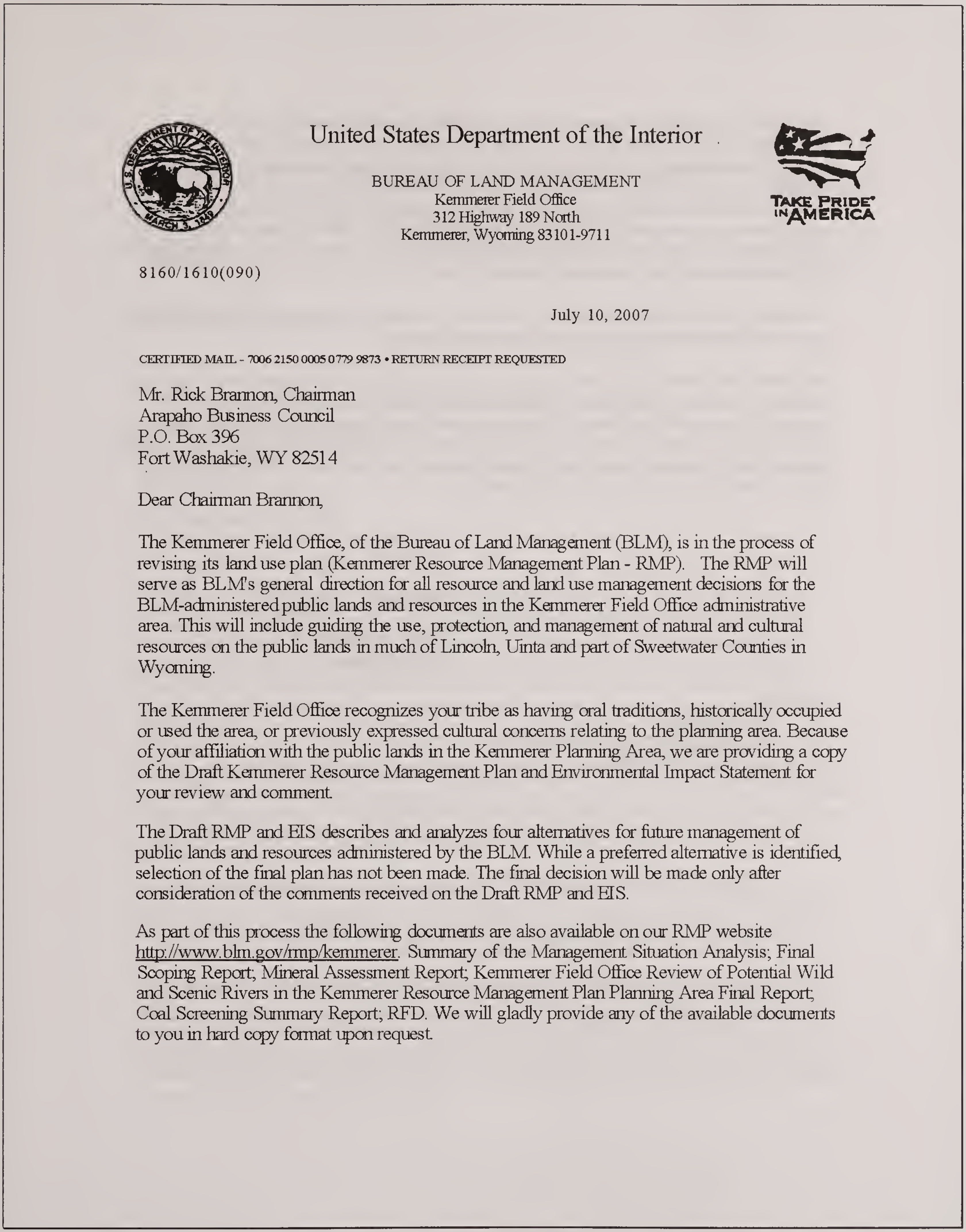
B. Received by (*Printed Name*)
C. Date of Delive

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

AUG 15 2005

3. Service Type
Certified Mail Express Mail
Registered Return Receipt for Merchant
Insured Mail C.O.D.

4. Restricted Delivery? (Extra *Fee*) Yes



MARCH 3, 1849

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Kemmerer Field Office
312 Highway 189 North
Kemmerer, Wyoming 83101-9711

TAKE PRIDE IN AMERICA

8160/1610(090)

July 10, 2007

CERTIFIED MAIL - 7006 2150 0005 0779 9873 • RETURN RECEIPT REQUESTED

Mr. Rick Brannon, Chairman
Arapaho Business Council
P.O. Box 396
Fort Washakie, WY 82514

Dear Chairman Brannon,

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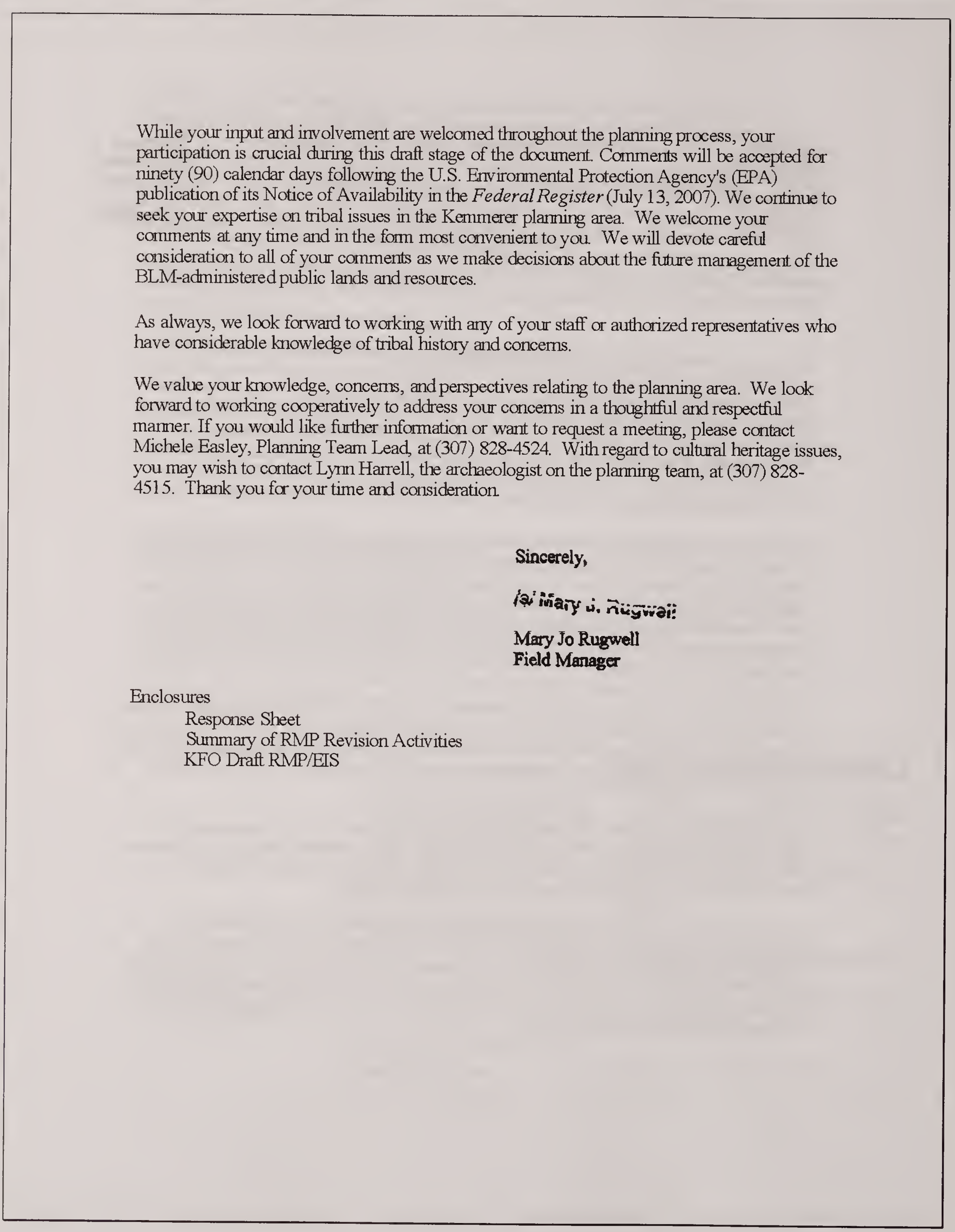

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Sincerely,

/s/ Mary J. Rugwell

Mary Jo Rugwell
Field Manager

Enclosures
- Response Sheet
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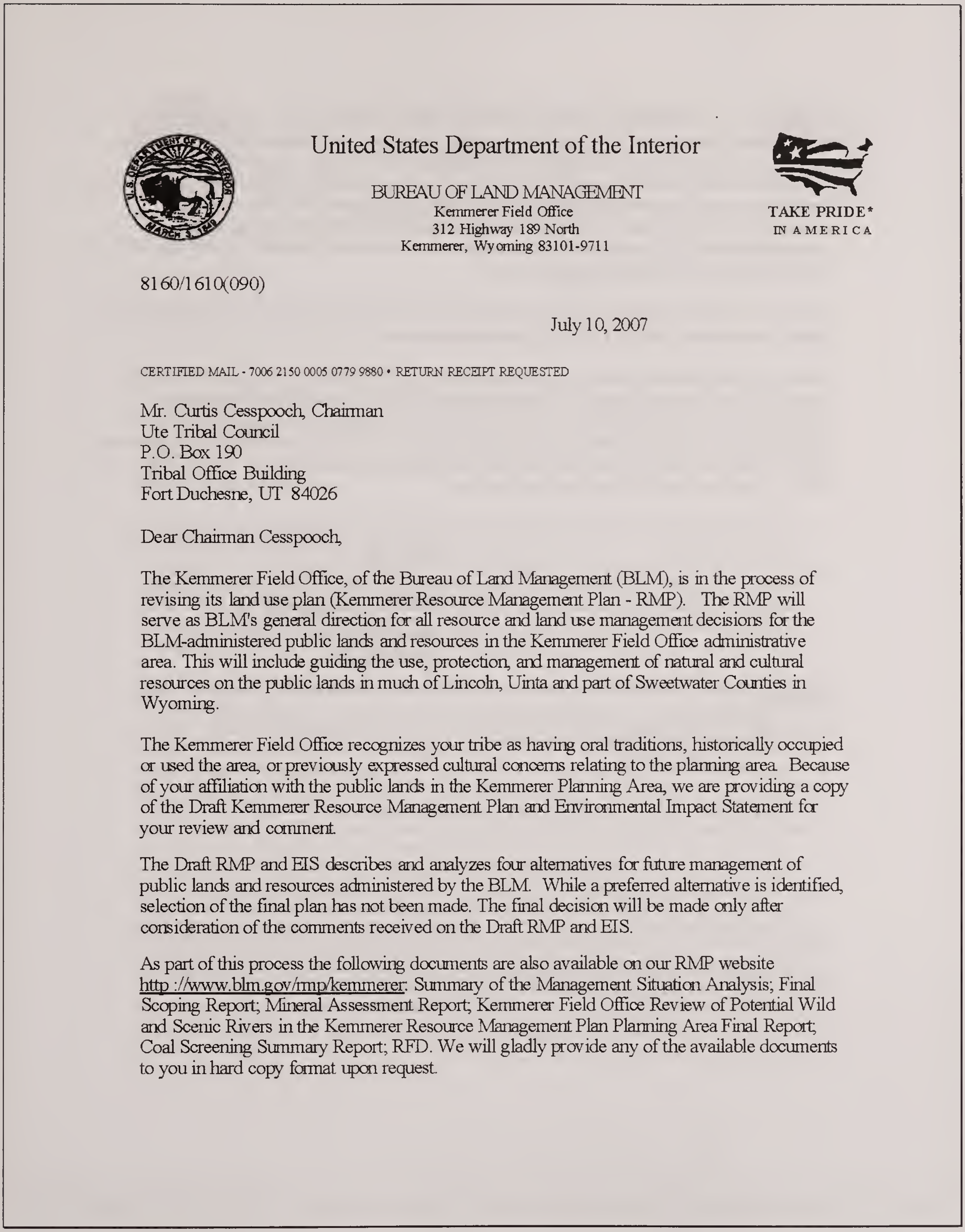

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Kemmerer Field Office
312 Highway 189 North
Kemmerer, Wyoming 83101-9711

TAKE PRIDE*
IN AMERICA

8160/1610(090)

July 10, 2007

CERTIFIED MAIL - 7006 2150 0005 0779 9880 • RETURN RECEIPT REQUESTED

Mr. Curtis Cesspooch, Chairman
Ute Tribal Council
P.O. Box 190
Tribal Office Building
Fort Duchesne, UT 84026

Dear Chairman Cesspooch,

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Mary Jo Rugwell
Field Manager

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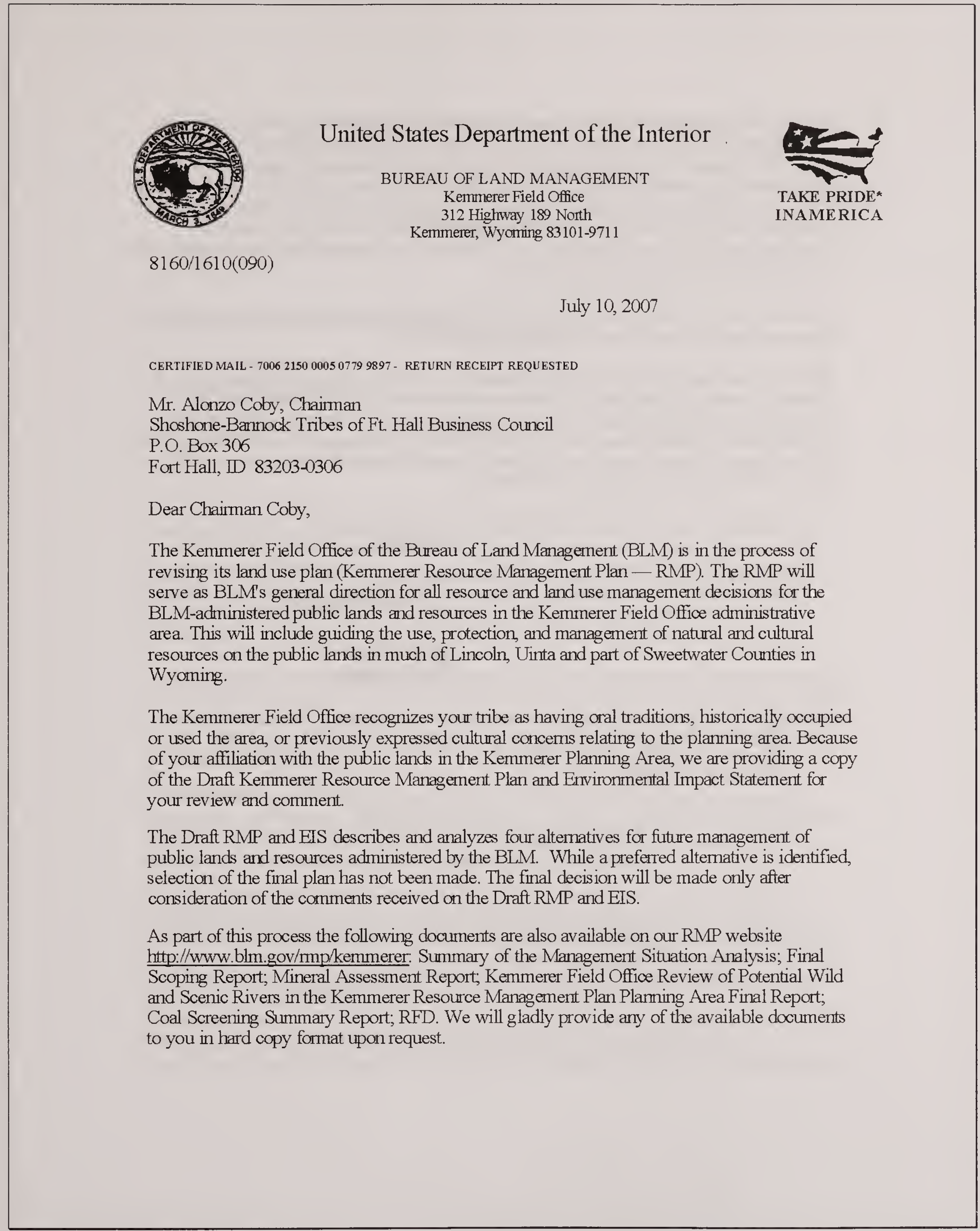

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Kemmerer Field Office
312 Highway 189 North
Kemmerer, Wyoming 83101-9711

TAKE PRIDE*
IN AMERICA

8160/1610(090)

July 10, 2007

CERTIFIED MAIL - 7006 2150 0005 0779 9897 - RETURN RECEIPT REQUESTED

Mr. Alonzo Coby, Chairman
Shoshone-Bannock Tribes of Ft. Hall Business Council
P.O. Box 306
Fort Hall, ID 83203-0306

Dear Chairman Coby,

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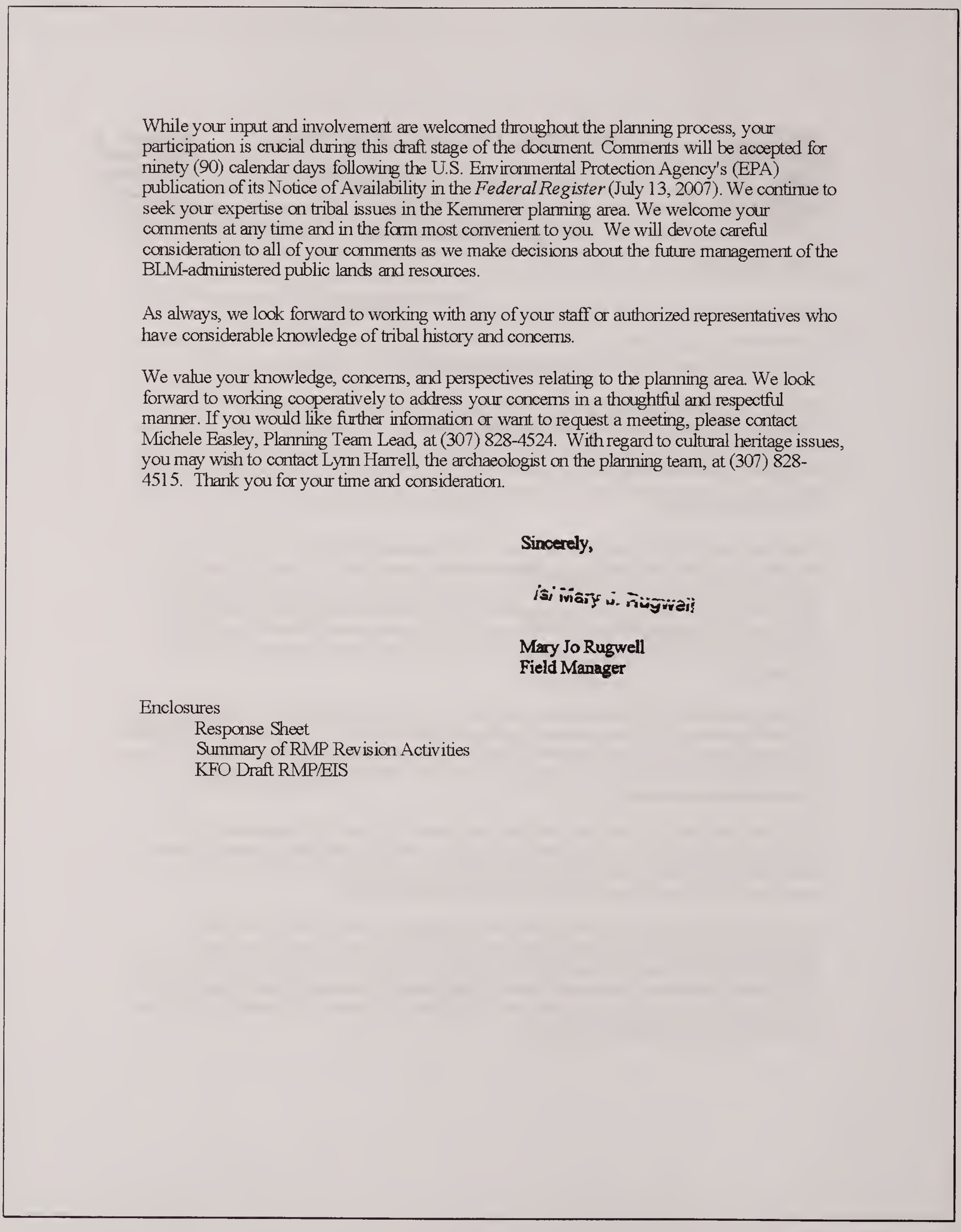

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/s/ Mary J. Rugwell

Mary Jo Rugwell
Field Manager

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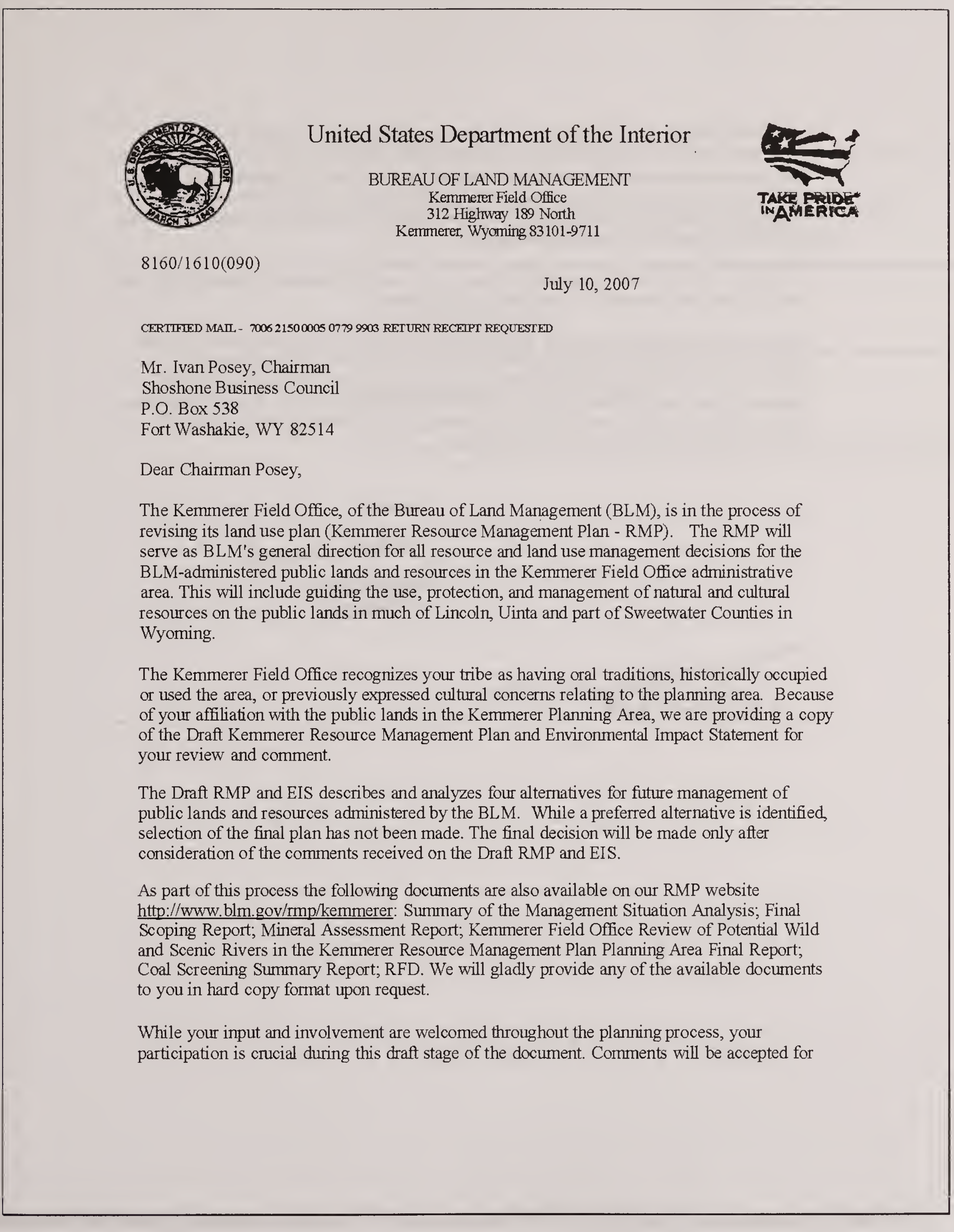

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Kemmerer Field Office
312 Highway 189 North
Kemmerer, Wyoming 83101-9711

8160/1610(090)

July 10, 2007

CERTIFIED MAIL - 7006 2150 0005 0779 9903 RETURN RECEIPT REQUESTED

Mr. Ivan Posey, Chairman
Shoshone Business Council
P.O. Box 538
Fort Washakie, WY 82514

Dear Chairman Posey,

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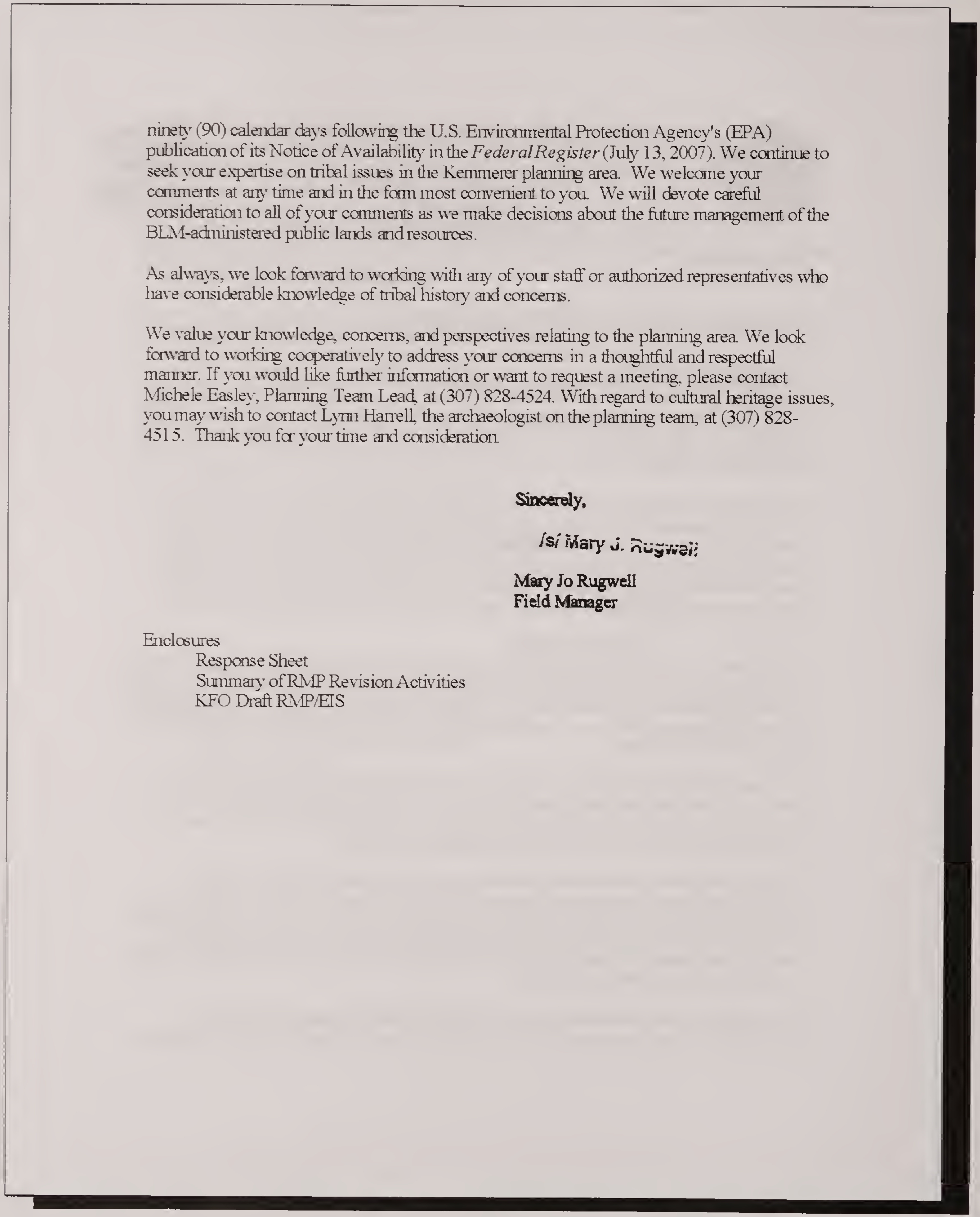

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KEMMERER
PROPOSED RESOURCE MANAGEMENT PLAN AND
FINAL ENVIRONMENTAL IMPACT STATEMENT

Appendix D

Water Disposal Requirements

Appendix D
Water Disposal Requirements

Wyoming Pollutant Discharge Elimination System (WYPDES) permits required by the State of Wyoming regulate water quality changes. The WYPDES Storm Water Program requires the implementation, inspection, and maintenance of BMPs according to Storm Water Pollution Prevention Plans (SWPPP) that also contain erosion and sediment control plans.

Streams and Flow Connected Surface Features Disposal Plans

Plans for any proposed activities that will result in disposal of produced water to channels on public lands will, at a minimum, contain provisions for the following in their operating plans:

- A sufficient design, monitoring plan, and response plan to ensure that all reasonable precautions are taken to detect and prevent violation of Wyoming State surface and ground Water Quality Standards as defined by The Wyoming Department of Environmental Quality.
- An initial survey and evaluation of the public land portion of the channel from the proposed point of discharge to the downstream extent of Bureau of Land Management (BLM)- managed lands or the confluence of the nearest perennial water with a natural base flow four times greater than the total produced water from all sources to the channel in question at the point of confluence. The evaluation will address channel geometry and record current locations (e.g., Global Positioning System, monumenting, photo points) and nature of key features, such as vegetative communities, headcuts, depositional areas, existing wetlands, any other discharges, etc. The initial report will be provided to the BLM with sufficient time prior to initial disposal of produced water to allow for analysis and adjustments to the disposal plan (including potential refusal). Subsequent reports will be provided to the BLM not more than 2 weeks past the date of the survey.
- Channels on public lands receiving produced water disposals will be resurveyed annually by the project proponent in the manner described above, at a minimum, or as requested by the BLM. The need to take corrective actions will be determined by the BLM.
- Adequate design to minimize erosion at the point of disposal and to prevent channel drops (headcuts) from traveling up channel under augmented flows and natural flow conditions post disposal.
- A method to control, in a timely manner, accelerated channel erosion. Corrective actions could include, but are not limited to, engineered structures, vegetation augmentation and (or) elimination of disposal(s) to the affected channel(s), and so on.

Upland Disposal Plans

Plans for any proposed disposal of produced water to public land uplands will, at a minimum, contain provisions for the following within their operating plan:

- Another avenue for the disposal of the water that can be used at any time.
- Certification that the water meets or exceeds Wyoming Department of Environmental Quality standards for agricultural ground water.
- Information to support analysis that application of the water to the soil will not adversely affect soil quality, including infiltration or fertility.
- Information to support analysis that vegetative diversity and productivity, soil health, and structure will not be adversely affected.

- Information to support analysis that volumes of water applied would not be in excess of that needed to establish appropriate vegetation communities.
- A statement that there will be no surface runoff from the site and that corrective action will be taken if it occurs.
- An approved revegetation plan that includes a weed management plan.
- A monitoring plan and provisions for prompt action to address a decline in resource conditions.
- A timeline to assure that irrigation efforts used to establish vegetation communities would not be used to maintain them.

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Appendix E

Common and Scientific Names of Plant and Wildlife Species Identified in this Final Environmental Impact Statement

Appendix E
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Table E-1. Common and Scientific Names of Plant and Wildlife Species Identified in the Final Environmental Impact Statement

Common Name	Scientific Name
Plants	
Alder	*Alnus* spp.
Alfalfa	*Medicago sativa*
Alkali cordgrass	*Spartina gracilis*
Alkali sacaton	*Sporobolus airoides*
Astragalus	*Astragalus* spp.
Barley	*Hordeum vulgare*
Basin big sagebrush	*Artemisia tridentata* spp. *tridentata*
Beaver-rim phlox	*Phlox pungens*
Big bluegrass (Sandberg's bluegrass)	*Poa secunda*
Big sagebrush	*Artemisia tridentata*
Bigtooth maple	*Acer gradidentatum*
Birch	*Betula* spp.
Bitterbrush	*Purshia tridentata*
Black greasewood	*Sarcobatus vermiculatus*
Black henbane	*Hyoscyamus niger*
Bladderpods	*Utricularia macrorhiza*
Blue grama	*Bouteloua gracilis*
Bluebunch wheatgrass	*Agropyron spicatum*
Boxelder	*Acer negundo*
Buckwheat	*Polygonum spp.*
Buffalograss	*Buchloe dactyloides*
Bulrush	*Schoenoplectus* spp.
Canada thistle	*Cirsium arvense*
Cattail	*Typha* spp.
Chokecherry	*Prunus virginiana*
Common burdock	*Arctium minus*
Common St. Johnswort	*Hypericum perforatum*
Common tansy	*Tanacetum vulgare*
Compact gilia	*Ipomopsis crebrifolia*
Cottonwood	*Populus* spp.
Currant	*Ribes* spp.
Dalmation toadflax	*Linaria genistifolia* ssp. *dalmatica*
Deep creek cinquefoil	*Potentilla multisecta*
Desert glandular phacelia	*Phacelia glandulosa* var. *deserta*
Diffuse knapweed	*Centaurea diffusa*

Table E-1. Common and Scientific Names of Plant and Wildlife Species Identified in the Final Environmental Impact Statement *(Continued)*

Common Name	Scientific Name
Divergent wild buckwheat	*Eriogonum divaricatum*
Dorn's twinpod	*Physaria dornii*
Douglas fir	*Pseudotsuga menziesii*
Douglas' campion	*Silene douglasii*
Downy brome (cheatgrass)	*Bromus tectorum*
Dwarf mistletoe	*Arceuthobium pusillum*
Dyers woad	*Isatis tinctoria*
Englemann spruce	*Picea engelmannii*
Entire-leaved peppergrass	*Lepidium integrifolium var. integrifolium*
Erect cryptantha	*Cryptantha stricta*
Field bindweed	*Convolvulus arvensis*
Fullstem	*Chamaechaenactis scaposa*
Gardner saltbush	*Atriplex garnderi*
Garrett's beardtongue	*Penstemon scariosus* var. *garrettii*
Goldenweed	*Pyrrocoma* spp.
Greasewood	*Sarcobatus vermiculatus*
Great Basin downingia	*Downingia laeta*
Green rabbitbrush	*Chrysothamnus viscidiflorus*
Hawthorn	*Crataegus* spp.
Hayden's milkvetch	*Astragalus bisulcatus* var. *haydenianus*
Hoary cress (whitetop)	*Cardaria draba and Cardaria pubescens Desv.*
Houndstongue	*Cynoglossum officinale*
Idaho fescue	*Festuca idahoensis*
Inland saltgrass	*Distichlis spicata*
Japanese brome	*Bromus japonicus*
Juniper	*Juniperus* spp.
Juniper prickly pear	*Opuntia polyacantha* var. *juniperina*
King's milkvetch	*Astragalus calycosus* var. *calycosus*
Knapweed	*Centaurea* spp.
Large-fruited bladderpod	*Lesquerella macrocarpa*
Leafy spurge	*Euphorbia esula*
Limber pine	*Pinus flexilis*
Locoweed	*Astragalus* spp.
Lodgepole pine	*Pinus contorta*
Low bladderpod	*Lesquerella prostrata*
Lupine	*Lupinis* spp.
Milkvetch	*Astragalus* spp.
Moab milkvetch	*Astragalus coltonii* var. *moabensis*
Mountain big sagebrush	*Artemisia tridentata* var. *vaseyana*
Mountain mahogany	*Cercocarpus montanus*

Table E-1. Common and Scientific Names of Plant and Wildlife Species Identified in the Final Environmental Impact Statement *(Continued)*

Common Name	Scientific Name
Musk thistle	*Carduus nutans*
Narrowleaf goldenweed	*Haplopappus macronema* var. *linearis*
Narrow-leaved bladderpod	*Lesquerella parvula*
Needle-and-thread	*Stipa comata*
Nevada sweetpea	*Lathyrus lanszwertii* var. *lanszwertii*
Old man's whiskers	*Geum triflorum*
Ox-eye daisy	*Chrysanthemum leucanthemum*
Penstemon	*Penstemon* spp.
Perennial pepperweed (giant whitetop)	*Lepidium latifolium*
Perennial sowthistle	*Sonchus arvensis*
Phlox	*Phlox* spp.
Plumeless thistle	*Carduus acanthoides*
Ponderosa pine	*Pinus ponderosa*
Prairie cordgrass	*Spartina pectinata*
Prairie junegrass	*Koeleria macrantha*
Prostrate bladderpod	*Lesquerella prostrata*
Purple loosestrife	*Lythrum salicaria*
Quackgrass	*Agropyron repens*
Quaking aspen	*Populus tremuloides*
Richardson's geranium	*Geranium richardsonii*
Rocky Mountain juniper	*Juniperus scopulorum*
Rocky Mountain maple	*Acer glabrum*
Rufous-spine prickly pear	*Opuntia polyacantha* var. *rufispina*
Rushes	*Juncus* spp.
Russian knapweed	*Centaurea repens*
Sagebrush	*Artemisia* spp.
Salt cedar (tamarisk)	*Tamarix gallica*
Saltbush	*Atriplex* spp.
Saltgrass	*Distichlis spicata*
Sandberg's bluegrass (big bluegrass)	*Poa secunda*
Scotch thistle	*Onopordum acanthium*
Seablite	*Suaeda esteroa*
Sedge	*Carex* spp.
Serviceberry	*Amelanchier alnifolia*
Shadscale saltbush	*Atriplex confertifolia*
Shrubby cinquefoil	*Dasiphora floribunda*
Sickle saltbush	*Atriplex falcata*
Silver sagebrush	*Artemisia canescens*
Skeletonleaf bursage	*Franseria discolor Nutt.*
Snowberry	*Symphoricarpos* spp.

Table E-1. Common and Scientific Names of Plant and Wildlife Species Identified in the Final Environmental Impact Statement *(Continued)*

Common Name	Scientific Name
Sodaville milkvetch	*Astragalus lentiginosus* var. *salinus*
Spike fescue	*Leucopoa kingii*
Spotted knapweed	*Centaurea maculosa*
Spruce	*Picea* spp.
St. Johnswort	*Hypericum* spp.
Subalpine fir	*Abies lasiocarpa*
Swallen mountain ricegrass	*Achnatherum swallenii*
Tansy	*Tanacetum vulgare*
Thickleaf pepperweed	*Lepidium integrifoium* var. *integrifolium*
Threadleaf sedge	*Carex filifolia*
Trelease's racemouse milkvetch	*Astragalus racemosus* var. *treleasei*
Tufted twinpod	*Physaria condensata*
Tunp range twinpod	*Physaria dornii*
Twinpods	*Physaria didymocarpa*
Uinta greenthread	*Thelesperma pubescens*
Utah juniper	*Juniperus osteosperma*
Ute ladies'-tresses	*Spiranthes diluvialis*
Western bladderpod	*Lesquerella multiceps*
Western wheatgrass	*Pascopyrum smithii*
White-margined phlox	*Phlox albomarginata*
Wild oats	*Avena fatua*
Wild plum	*Prunus americana*
Willow	*Salix* spp.
Wyoming big sagebrush	*Artemisia tridentata* var. *wyomingensis*
Yellow toadflax	*Linaria vulgaris*
Yellowstar thistle	*Centaurea solstitialis*
Fish	
Bluehead sucker	*Catostomus discobolus*
Bonneville cutthroat trout	*Oncorhynchus clarkii utah*
Bonytail	*Gila elegans*
Colorado pikeminnow	*Ptychocheilus lucius*
Colorado River cutthroat trout	*Oncorhynchus clarkii pleuriticus*
Common carp	*Cyprinus carpio*
Cutthroat trout	*Oncorhynchus clarki*
Flannelmouth sucker	*Catostomus latipinnis*
Humpback chub	*Gila cypha*
Leatherside chub	*Snyderichthys copei*
Razorback sucker	*Xyrauchen texanus*
Roundtail chub	*Gila robusta*
Snake River cutthroat trout	*Oncorhynchus clarkii*

Table E-1. Common and Scientific Names of Plant and Wildlife Species Identified in the Final Environmental Impact Statement *(Continued)*

Common Name	Scientific Name
Wildlife	
American avocet	*Recurvirostra americana*
American kestrel	*Falco sparverius*
American marten	*Martes americana*
Badger	*Taxidea taxus*
Bald eagle	*Haliaeetus leucocephalus*
Beaver	*Castor canadensisis*
Bison	*Bison bison*
Black bear	*Ursus americanus*
Black-footed ferret	*Mustela nigripes*
Blue grouse	*Dendragapus obscurus*
Bobcat	*Lynx rufus*
Boreal chorus frog	*Pseudacris maculata*
Boreal toad	*Bufo boreas boreas*
Boreal western toad	*Bufo boreas*
Brewer's sparrow	*Spizella breweri*
Burrowing owl	*Speotyto cunicularia*
Canada geese	*Branta canadensis*
Canada lynx	*Lynx canadensis*
Cinnamon teal	*Anas cyanoptera*
Columbia spotted frog	*Rana luteiventris*
Cooper's hawk	*Accipiter cooperii*
Cottontail rabbit	*Sylvilagus* spp.
Coyote	*Canis latrans*
Eastern short-horned lizard	*Phrynosoma douglassii brevirostre*
Ferruginous hawk	*Buteo regalis*
Golden eagle	*Aquila chrysaetos*
Gray wolf	*Canis lupus*
Great Basin spadefoot toad	*Spea intermontana*
Greater sage-grouse	*Centrocercus urophasianus*
Great horned owl	*Bubo virginianus*
Grizzly bear	*Ursus arctos horribilis*
Ground squirrels	*Spermophilus* spp.
Idaho pocket gopher	*Thomomys idahoensis*
Jackrabbit	*Lepus* spp.
Killdeer	*Charadrius vociferus*
Loggerhead shrike	*Lanius ludovicianus*
Long-billed curlew	*Numenius americanus*
Long-eared myotis	*Myotis evotis*
Long-eared owl	*Asio otus*

Table E-1. Common and Scientific Names of Plant and Wildlife Species Identified in the Final Environmental Impact Statement *(Continued)*

Common Name	Scientific Name
Mallard	*Anas platyrhynchos*
Mink	*Mustela vison*
Moose	*Alces alces*
Mountain lion	*Puma concolor*
Mountain plover	*Charadrius montanus*
Mourning dove	*Zenaida macroura*
Mule deer	*Odocoileus hemionus*
Muskrat	*Ondata zibethicus*
Northern goshawk	*Accipiter gentilis*
Northern harrier	*Circus cyaneus*
Northern leopard frog	*Rana pipiens*
Northern saw-whet owl	*Aegolius acadicus*
Osprey	*Pandion haliaetus*
Peregrine falcon	*Falco peregrinus*
Plains pocket gopher	*Geomys bursarius*
Porcupine	*Erethizon dorsatum*
Prairie dog	*Cynomys* spp.
Prairie falcon	*Falco mexicanus*
Pronghorn	*Antilocapra americana*
Pygmy rabbit	*Brachylagus idahoensis*
Raccoon	*Procyon lotor*
Red fox	*Vulpes vulpes*
Red squirrel	*Tamiasciurus hudsonicus*
Red-naped sapsucker	*Sphyrapicus nuchalis*
Red-tailed hawk	*Buteo jamaicensis*
Rock dove	*Columba livia*
Rocky Mountain elk	*Cervus elaphus*
Rough-legged hawk	*Buteo lagopus*
Rubber boa	*Charina bottae*
Ruffed grouse	*Bonasa umbellus*
Sage sparrow	*Amphispiza belli*
Sage thrasher	*Oreoscoptes montanus*
Sagebrush lizard	*Sceloporus graciosus*
Sharp-shinned hawk	*Accipiter striatus*
Short-eared owl	*Asio flammeus*
Snowshoe hare	*Lepus americanus*
Snowy owl	*Bubo scandiacus*
Spotted frog	*Rana* spp.
Spotted skunk	*Spilogale gracilis*
Striped skunk	*Mephitis mephitis*

Table E-1. Common and Scientific Names of Plant and Wildlife Species Identified in the Final Environmental Impact Statement *(Continued)*

Common Name	Scientific Name
Swainson's hawk	*Buteo swainsoni*
Swift fox	*Vulpes velox*
Tiger salamander	*Ambystoma tigrinum*
Trumpeter swan	*Cygnus buccinator*
Turkey vulture	*Cathartes aura*
Wandering garter snake	*Thamnophis elegans vagrans*
Warbling vireo	*Vireo gilrus*
White-faced ibis	*Plegadis chihi*
White-tailed jackrabbit	*Lepus townsendii*
White-tailed prairie dog	*Cynomys leucurus*
Wolverine	*Gulo gulo*
Woodrat	*Neotoma* spp.
Yellow-billed cuckoo	*Coccyzum americanus*
Invertebrates	
Douglas-fir bark beetle	*Dendroctonus pseudotsugae*
Grasshopper	*Orchelimum vulgare*
Mormon cricket	*Anabrus simplex*
Mosquito	*Culicidae* spp.
Mountain pine beetle	*Dendroctonus ponderosae*
Western balsam bark beetle	*Dryocoetes confusus*
Alfalfa weevil	*Hypera postica*
Beet leafhopper	*Circulifer tenellus*
Cattle grub	*Hypoderma lineatum*

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Appendix F

Exception, Modification, and Waiver Criteria

Appendix F
Exception, Modification, and Waiver Criteria

PROCESSING EXCEPTIONS TO SEASONAL RESTRICTIONS

A request for an exception must be initiated in writing to the field manager by the public land user near the time of conducting the work. To assist with project planning, the request should be made at least 7 days before the proposed construction date. The unpredictability of weather, animal movement and condition, and so on, precludes analysis of requests more than 1 week before the proposed construction time periods. Some species may require reanalysis every 2 weeks to ensure that conditions have not changed, which could result in adverse impacts to the species.

Each request is considered a unique action and is analyzed and documented individually for Resource Management Plan and National Environmental Policy Act compliance. Processing also may include coordination with the Wyoming Game and Fish Department (WGFD).

Exceptions to Seasonal Restrictions

Activities within the planning area are managed with seasonal restrictions, no surface occupancies, or distance restrictions for sensitive and crucial habitats. Protective wildlife seasonal restrictions are consistent with statewide dates and (or) distances. For example, big game crucial winter ranges are protected from November 15 through April 30. This restriction is intended to protect big game if weather or other habitat needs dictate.

The Bureau of Land Management (BLM) can and does grant exceptions to seasonal restrictions if the BLM, in consultation with the WGFD, feels that granting an exception would not adversely impact the population being protected. The BLM uses a set of criteria when considering a request for an exception. Professional judgment plays a key part in the BLM's decisions on whether to grant exceptions. No clear-cut formula exists.

The following section is an example of factors considered by the BLM when determining whether a request for an exception to crucial big game winter range should be granted. Similar criteria and (or) data are used when considering granting exceptions for other protected species, such as greater sage-grouse, elk calving areas, mountain plover, and pygmy rabbits.

Factors Considered

1. Resource Concerns
   - Animal presence or absence
   - Additional or new resource concerns
   - Potential for increased wildlife accidents or poaching
2. Animal Conditions
   - Physical condition of individual animals (e.g., fat reserves)
   - Local animal population condition (animal density)
   - Potential for additive mortality
   - Likelihood of introduction or increased incidence of disease
   - Likelihood of decreased recruitment/birth rate

3. Climate/Weather
    - Snow conditions (depth, crusting, longevity)
    - Current and historic local precipitation patterns
    - Current and historical seasonal weather patterns
    - Recent and current windchill factors (indication of animals energy use)
    - Duration of condition
    - Short- and long-range forecasts
4. Habitat Condition and Availability
    - Water and forage condition (availability, quality, and quantity)
    - Competition (interspecific, intraspecific)
    - Animal use of available forage
    - Suitable and ample forage immediately available and accessible
5. Spatial Considerations
    - Migration/travel corridors
    - Winter range, foraging, parturition or breeding
    - Topography (plains vs. mountains)
    - Topographic/geographic limitations (barriers)
    - Presence of thermal cover (e.g., protection from wind)
    - Proportion of range impacted
    - Juxtaposition and density of other activities/disturbances in the vicinity
    - Cumulative impacts
6. Timing
    - When proposed activity would occur in the stipulation period
    - Kind and duration of potentially disruptive activity
    - Likelihood of animals habituating to the proposed activity

Modification or Waiver of Lease Stipulations

Title 43 CFR 3101.1-4 establishes procedures for granting modifications or waivers to oil and gas lease stipulations, as stated below:

> *A stipulation included in an oil and gas lease shall be subject to modification or waiver only if the authorized officer determines that the factors leading to its inclusion in the lease have changed sufficiently to make the protection provided by the stipulation no longer justified or if proposed operations would not cause unacceptable impacts. If the authorized officer has determined, prior to lease issuance, that a stipulation involves an issue of major concern to the public, modification or waiver of the stipulation shall be subject to public review for at least a 30-day period. In such cases, the stipulation shall indicate that public review is required before modification or waiver. If subsequent to lease issuance the authorized officer determines that a modification or waiver of a lease term or stipulation is substantial, the modification or waiver shall be subject to public review for at least a 30-day period.*

The modification or waiver of an oil and gas lease stipulation implies that the sensitive resource for which the protective measure was considered is in some way not present in the area or in some way no longer in need of the protective measure. In either case, consideration of a modification or waiver of a lease stipulation would require environmental analysis and may result in an amendment to the land use plan.

Onshore Order 1 (May 2007) requires that all pits and interim reclamation be done within 6 months after drilling or plugging operations are complete. In specific operations where pits and reclamation cannot be completed in the necessary timeframes, and if stockpiles are required for longer than the identified 6 month timeframe, the permittee or designated agent would be required to submit a plan that would mitigate the impacts of disturbance greater than 6 months.

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PROPOSED RESOURCE MANAGEMENT PLAN AND
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Appendix G

Lands Identified for Disposal

Appendix G
Lands Identified for Disposal

Lands Identified for Potential Disposal Under Alternatives A and C

Main Portion of the Resource Area

Range 110
T. 18 N., R. 110 W.
Sec. 14: All

Range 111
T. 18 N., R. 111 W.
Sec. 14: All

T. 19 N., R. 111 W.
Sec. 28: SE¼

Range 112
T. 20 N., R. 112 W.
Sec. 20: SE¼NE¼, SE¼SW¼, NW¼SE¼
Sec. 28: N½NE¼, SE¼NE¼, NE¼NW¼, E½SE

T. 22 N. R. 112 W.
Sec. 18: All

T. 23 N., R. 112 W.
Sec. 12: SE¼SW¼SW¼, SW¼SE¼SE¼
Sec. 13: NE¼NW¼NE¼, NW¼NE¼NE¼

T. 26 N., R. 112 W.
Sec. 6: Lots 3, 4, 5, 9, and 12 to 29 inclusive
Sec. 7: Lot 5

Range 113
T. 21 N., R. 113 W.
Sec. 16: Lots 1 to 7 inclusive
Sec. 20: Lots 1 to 4 inclusive, and 6 to 10 inclusive
Sec. 30: Lot 2

Range 114
T. 16 N., R. 114 W.
Sec. 28: NW¼NW¼

T. 21 N., R. 114 W.
Sec. 25: Lots 1, 2, 3
Sec. 26: Lots 1, 2, 3, 4, 6, 7
Sec. 27: Lots 2, 3
Sec. 28: Lots 1, 2, 3, 4, 5, 6, 7, NE¼NW¼ N½NE¼

Range 115
T. 14 N., R. 115 W.
Sec. 20: SE¼SE¼
Sec. 22: SE¼NE¼, NE¼SW¼
Sec. 29: NE¼NW¼, E½E½

T. 15 N., R. 115 W.
Sec. 7: Lot 2
Sec. 31: SE¼NE¼

T. 16 N., R. 115 W.
Sec. 29: NW¼NE¼

T. 21 N., R. 115 W.
Sec. 18: SW¼NE¼, SE¼NW¼
Sec. 19: Lots 2 and 3, SE¼NW¼, NE¼SW¼

T. 25 N., R. 115 W.
Sec. 18: Lot 1

Range 116
T. 14 N., R. 116 W.
Sec. 6: Lots 1, 2, 3, 4, 5, 6, 7, S½NE¼ SE¼NW¼, E½SW¼, SE¼
Sec. 17: NW¼NE¼
Sec. 21: SE¼SW¼
Sec. 29: Lot 1

T. 15 N., R. 116 W.
Sec. 8: Lots 5, 7, 8
Sec. 11: NW¼SE¼
Sec. 12: NW¼NE¼, SE¼NE¼, NE¼NW¼
Sec. 15: W½NE¼, E½NW¼, NE¼SW¼, NW¼SE¼
Sec. 16: NE¼, E½NW¼, SW¼NW¼
Sec. 20: Lots 5 to 8 inclusive
Sec. 21: NW¼NW¼
Sec. 22: NE¼SE¼
Sec. 23: SE¼SE¼
Sec. 25: N½NW¼, SW¼NW¼
Sec. 26: E½NE¼
Sec. 27: NW¼NW¼
Sec. 32: Lots 5 to 8 inclusive

T. 20 N., R. 116 W.
Sec. 4: Lot 1

Range 116 (Continued)
T. 21 N., R. 116 W.
Sec. 17: Tracts 98A, 98B, 98C, 98D
Sec. 24: Lots 3, 4, 5, 6, 7, 8
Sec. 25: Lots 1, 2, 4, 5

T. 22 N., R. 116 W.
Sec. 11: Tract 62, Lots 7, 10, 15, 21, Tract 57, Lot 20
Sec. 13: Lots 19, 20
Sec. 14: Tract 57, Lots 4, 9
Sec. 24: Lot 11

T. 23 N., R. 116 W.
Sec. 25: Lot 2, SW¼NE¼, SE¼NW¼, NW¼SE¼
Sec. 26: Lot 2
Sec. 35: NW¼NW¼

T. 25 N., R. 116 W.
Sec. 1: Lots 6, 7, 8

Range 117
Sec. 4: Lots 2, 3, 4, SW¼NE¼, S½NW¼
Sec. 6: Lot 1, SE¼NE¼, NE¼SE¼
Sec. 8: SE¼NE¼, SE¼

T. 14 N., R. 117 W.
Sec. 2: Lots 1, 2, 3, 4, S½N½, S½
Sec. 4: Lots 3, 4, S½NW¼, E½SE¼, SW¼SE¼
Sec. 6: Lots 1, 2, 3, 4, 5, 6, 7, S½NE¼ SE¼NW¼, E½SW¼, SE¼
Sec. 10: All
Sec. 12: N½
Sec. 20: E½
Sec. 24: All
Sec. 26: All
Sec. 28: All
Sec. 30: E½SE¼

T. 15 N., R. 117 W.
Sec. 8: All
Sec. 12: NW¼, W½SW¼
Sec. 14: W½
Sec. 18: Lots 1, 2, 3, 4, E½W½, E½
Sec. 20: All
Sec. 22: All
Sec. 24: N½N½, S½S½
Sec. 26: All
Sec. 28: W½W½
Sec. 30: Lots 1, 2, 3, 4, E½, E½W½
Sec. 32: S½
Sec. 34: All

Range 117 (Continued)
T. 22 N., R. 117 W.
Sec. 1: Lots 9, 10, 11
Sec. 12: Lot 1

T. 23 N., R. 117 W.
Sec. 3: Lots 7, 10
Sec. 15: Lot 4
Sec. 22: E½SW¼, NW¼SE¼

T. 24 N. R. 117 W.
Sec. 2: Lots 6, 8, 9, 13, 16, 17, 18, 19
Sec. 3: Lots 5, 6, 7, 8
Sec. 4: Lots 5, 10, 12, 13
Sec. 10: Lot 1
Sec. 30: Lots 6, 7, 9, 15
Sec. 35: Lot 7

Range 118
T. 13 N., R. 118 W.
Sec. 4: Lots 3, 4, S½NW¼, SW¼
Sec. 6: Lots 3, 4, 5, 6
Sec. 8: NE¼, SW¼SW¼, N½SE¼, SE¼SE¼
Sec. 10: All
Sec. 14: E½, W½W½
Sec. 18: E½, W½W½
Sec. 20: E½
Sec. 32: SW¼

T. 14 N., R. 118 W.
Sec. 2: Lots 1, 2, 3, 4, S½N½, S½
Sec. 6: Lots 1, 2, 3, 4, 5, 6, 7 S½NE¼, SE¼NW¼, E½SW¼, SE¼
Sec. 8: W½E½, NW¼, S½SW¼
Sec. 12: N½N½, SW¼NW¼
Sec. 18: Lots 1, 2, 3, 4, NE¼, E½W½
Sec. 20: All
Sec. 28: All
Sec. 30: N½, SW¼, W½SE¼, SE¼SE¼

T. 15 N., R. 118 W.
Sec. 4: Lots 1, 4, SE¼NE¼, SW¼NW¼, S½
Sec. 10: N½NE¼, W½, S½SE¼
Sec. 12: SE¼NW¼, SE¼
Sec. 14: NW¼
Sec. 18: Lots 1, 2, 3, E½, E½NW¼, NE¼SW¼
Sec. 20: All
Sec. 22: NE¼, W½
Sec. 30: E½E½
Sec. 32: All
Sec. 34: NE¼SE¼, S½SE¼

T. 24 N., R. 118 W.
Sec. 30: Lot 7

Range 119
T. 12 N., R. 119 W.
Sec. 2: Lot 1, SE¼NE¼, E½SE¼
Sec. 12: W½W½
Sec. 14: E½E½
Sec. 20: Lot 4
Sec. 24: Lot 4, NW¼SW¼, W½NW¼

T. 13 N., R. 119 W.
Sec. 2: Lots 1, 2, S½NE¼, SE¼SE¼
Sec. 6: S½SE¼
Sec. 8: W½, W½E½
Sec. 24: W½W½
Sec. 32: SW¼

T. 14 N., R. 119 W.
Sec. 4: Lots 1, 2, 3, 4, S½N½, S½
Sec. 6: Lots 6, 7, E½SW¼, SE¼
Sec. 8: N½, ~~SE¼~~ (SOLD)
Sec. 10: E½E½, NW¼NE¼, N½NW¼, SW¼SE¼
Sec. 12: W½W½
Sec. 14: All
Sec. 20: E½E½
Sec. 22: All
Sec. 24: All
Sec. 26: All
Sec. 28: N½, N½S½
Sec. 35: Lots 9, 10, 11

T. 15 N., R. 119 W.
Sec. 12: All
Sec. 14: All,
Sec. 24: SW¼
Sec. 26: All
Sec. 32: N½NE¼, W½, E½SE¼

T. 19 N., R. 119 W.
Sec. 28: N½SE¼
Sec. 34: NE¼NW¼

T. 22 N., R. 119 W.
Sec. 8: Lot 31
Sec. 17: S½, NW¼NE¼, S½, N½NW¼, Tract 40, Lots 6, 7, 8

T. 24 N., R. 119 W.
Sec. 1: Tract 98, Lots 6, 16
Sec. 2: Tract 98. Lots 5, 20, 38
Sec. 3: Lots 36, 38, 40, 45, SE¼SW¼ SW¼SE¼, Tract 94, Lots 35, 44
Sec. 4: Lots 36, 37, 40, 45, Tract 91, Lots 28, 29, 41, 42, 46, 52, Tract 94, Lots 43, 44
Sec. 9: Lots 1, 4, 18, 19, 30, 31, SE¼NE¼, NE¼SE¼, Tract 91, Lots 2, 3, 6
Sec. 10: Lot 1, NW¼, N½SW¼, SE¼SW¼, S½SE¼
Sec. 11: SW¼SW¼
Sec. 14: Lot 9, W½NW¼
Sec. 15: Lots 1, 4, 5, 8, NE¼, E½W½, N½SE¼
Sec. 16: Lot 23
Sec. 19: Lots 7, 8,, E½SW¼
Sec. 20: Lot 28
Sec. 21: Lots 1, 19
Sec. 22: Lots 1, 2, N½NW¼, SW¼NW¼
Sec. 24: Lots 10, 11, 12, SW¼SW¼
Sec. 25: Lots 3, 27, 28, 29, 30, N½NW¼, SE¼NW¼, NW¼SW¼
Sec. 26: Lots 11, 14, 15, 16, 17, 18, 19
Sec. 29: Lots 6, 21
Sec. 35: Lots 1, 4, 6, 26, 27, NE¼NW¼
Sec. 36: Lots 5, 6

T. 25 N., R. 119 W.
Sec. 6: Lots 25, 26
Sec. 22: Tract 75, Lots 16, 26, Lot 27
Sec. 27: Lot 4
Sec. 29: Lots 26, 27, Tract 52, Lots 21, 23, 25, 28, 29, 31
Sec. 30: Lots 20, 25, Tract 52, Lot 26
Sec. 32: Tract 52, Lot 6

T. 27 N., R. 119 W.
Sec. 18: W½W½, SW¼SE¼
Sec. 19: W½W½, E½

Range 120
T. 14 N., R. 120 W.
Sec. 4: Lots 1 to 4 inclusive, S½N½,
Sec. 8: S½
Sec. 10: E½E½, NW¼NE¼, NW¼, SW¼SE¼
Sec. 14: All
Sec. 20: All
Sec. 24: N½, SW¼
Sec. 26: NE¼NE¼, E½SE¼
Sec. 28: S½
Sec. 30: S½N½, S½

T. 15 N., R. 120 W.
Sec. 10: W½NW¼

T. 22 N., R. 120 W.
Sec. 15: Lot 4

T. 23 N., R. 120 W.
Sec. 25: Lot 28
Sec. 36: Lot 23, 24, 25, 26

T. 24 N., R. 120 W.
Sec. 1: Lots 45, 46

Range 121
T. 13 N., R. 121 W.
Sec. 2: Lot 1
Sec. 10: Lots 2, 3
Sec. 12: NE¼NE¼
Sec. 24: NW¼SE¼

T. 14 N., R. 121 W.
Sec. 12: NW¼NW¼
Sec. 24: S½SE¼
Sec. 26: NE¼, SE¼NW¼, S½S½

Range 121 (Continued)
T. 15 N., R. 121 W.
Sec. 2: Lots 1, 2, S½NE¼, SE¼
Sec. 11: E½
Sec. 14: N½NE¼, SW¼NE¼, N½SE¼SE¼
Sec. 23: E½
Sec. 34: Lots 1 to 4 inclusive

T. 16 N., R. 121 W.
Sec. 23: E½
Sec. 26: SE¼
Sec. 35: E½

STAR VALLEY AREA

Range 118
T. 30 N., R. 118 W.
Sec. 5: Lot 4
Sec. 21: Lot 1
Sec. 28: Lot 1, E½NE¼, NE¼SE¼
Sec. 33: Lot 1, SE¼NE¼, E½SE¼

T. 31 N., R. 118 W.
Sec. 18: Lots 1, 2, 3, 4, W½NE¼
Sec. 19: Lot 1

T. 32 N., R. 118 W.
Sec. 31: E½NE¼, NE¼SE¼

T. 33 N., R. 118 W.
Sec. 28: E½SW¼

T. 34 N., R. 118 W.
Sec. 5: Lots 1, 5, 6, 9
Sec. 6: SE¼NE¼
Sec. 27: Lots 2, 3

Range 119
T. 30 N., 119 W.
Sec. 2: NE¼SE¼
Sec. 11: S½NE¼
Sec. 12: SW¼NW¼, NW¼SW¼

T. 31 N., R. 119 W.
Sec. 6: Lots 4, 5, 6
Sec. 7: Lots 1,4
Sec. 8: Lots 7, 8, SE¼SE¼
Sec. 9: SW¼SW¼
Sec. 17: Lot 7
Sec. 18: Lot 8 (reconveyed U.S.)
Sec. 21: W½SW¼

T. 33 N., R. 119 W.
Sec. 2: Lot 2, SE¼NE¼
Sec. 33: Lots 1, 2, 3, 4

T. 34 N., R. 119 W.
Sec. 22: Lots 3, 4, 5,
Sec. 35: Lots 1, 2, 3, 8, 9, NE¼SW¼

T. 36 N., R. 119 W.
Sec. 14: SE¼NE¼, N½SE¼
Sec. 24: E½E½
Sec. 25: NE¼NE¼, S½NE¼, SE¼

Lands Identified for Potential Disposal Under Alternative D (Proposed RMP)

Range 110
T. 18 N., R. 110 W.
Sec. 10: NE¼SW¼

Range 111
T. 18 N., R. 111 W.
Sec. 16: All

Range 114
T. 16 N., R. 114 W.
Sec. 28: NW¼NW¼
T. 21 N., R. 114 W.
Sec. 22: SE¼

Range 115
T. 14 N., R. 115 W.
Sec. 20: SE¼SE¼
Sec. 22: SE¼NE¼, NE¼SW¼
Sec. 29: NE¼NW¼, E½E½

T. 15 N., R. 115 W.
Sec. 7: Lot 2
Sec. 31, SE¼NE¼

Range 116
T. 14 N., R. 116 W.
Sec. 17: NW¼NE¼
Sec. 21: SE¼SW¼
Sec. 29: Lot 1

T. 15 N., R. 116 W.
Sec. 8: Lots 5, 7, 8
Sec. 20: Lots 5 to 8 inclusive
Sec. 21: NW¼NW¼
Sec. 22: NE¼SE¼
Sec. 23: SE¼SE¼
Sec. 25: N½NW¼, SW¼NW¼
Sec. 26: E½NE¼
Sec. 27: NW¼NW¼
Sec. 32: Lots 5 to 8 inclusive

T. 20 N., R. 116 W.
Sec. 4: Lot 1
Sec. 6: Lots 1, 2, 3, 4, 5, 6, E½SW¼, SE¼
Sec. 18: Lots 1, 2, 3, 4, E½, E½W½
Sec. 19: Lots 1, 2, 3, 4, NE¼NW¼, SE¼SW¼
Sec. 30: Lots 1, 2, 3, 4, E½, E½W½

T. 21 N., R. 116 W.
Sec. 11: Tract 68, lots 11, 17, 18, 19
Sec. 14: Tract 57, lots 1, 2, 3
Sec. 17: Tracts 98A, 98B, 98C, 98D
Sec. 19: Lots 5, 6, 7, 8, 9, 10, W½NW¼
Sec. 22: NE¼, NE¼SE¼

Range 116 (Continued)
T. 21 N., R. 116 W.
Sec. 27: E½NW¼, E½
Sec. 28: SE¼NE¼, E½SE¼
Sec. 30: Lots 5, 6, 7, 8, 9, 10, SW¼
Sec. 31: Lots 5, 6, 7, 8, 9, 10, 11, NW¼NW¼, SW¼SW¼
Sec. 33: Lot 1, N½NE¼NE¼, N½SW¼NE¼NE¼, SE¼SW¼NE¼NE¼, SE¼NE¼NE¼, N½NE¼SE¼NE¼, NW¼NE¼NE¼SE¼, S½N½NE¼SE¼, S½NE¼SE¼
Sec. 34: N½, E½SW¼, SE¼

T. 21 N., R. 116 W.
Sec. 35: lots 3, 4, 5, 6
Sec. 36: lots 4, 5

T. 23 N., R. 116 W.
Sec. 35: lot 11

T. 25 N., R. 116 W.
Sec. 1: Lots 6, 7, 8, SW¼NE¼, SE¼NW¼, SE¼SW¼
Sec. 2: Lots 5, 6, 7, 8, S½NW¼, SW¼

Range 117
T. 13 N., R. 117 W.,
Sec. 4: Lots 2, 3, 4, SW¼NE¼, S½NW¼, N½SW¼
Sec. 6: Lot 1, SE¼NE¼, NE¼SE¼
Sec. 8: SE¼NE¼, SE¼

T. 14 N., R. 117 W.,
Sec. 30: E½SE¼

T. 20 N., R. 117 W.
Sec. 3: SW¼
Sec. 4: Lot 1, E½SE¼
Sec. 9: E½NE¼, NE¼SE¼, S½SE¼
Sec. 10: W½
Sec. 15: SW¼
Sec. 21: N½NE¼
Sec. 22: W½, SE¼
Sec. 24: All
Sec. 26: All
Sec. 34: All

Range 118
T. 13 N., R. 118 W.,
Sec. 4: Lots 3, 4, S½NW¼, SW¼
Sec. 6: Lots 3, 4, 5, 6
Sec. 8: NE¼, SW¼SW¼, N½SE¼, SE¼SE¼
Sec. 10: All

Range 118 (Continued)
Sec. 14: E½, W½W½
Sec. 18: E½, E½W½
Sec. 20: E½

T. 13 N., R. 118 W.,
Sec. 32: SW¼

T. 14 N., R. 118 W.,
Sec. 2: Lots 1, 2, 3, 4, S½N½, S½
Sec. 6: Lots 1, 2, 3, 4, 5, 6, 7, S½NE¼, SE¼NW¼, E½SW¼, SE¼
Sec. 8: W½E½, NW¼, S½SW¼
Sec. 12: N½N½, SW¼NW¼
Sec. 18: Lots 1, 2, 3, 4, NE¼, E½W½
Sec. 20: All
Sec. 22: All
Sec. 28: All
Sec. 30: N½, SW¼, W½SE¼, SE¼SE¼
Sec. 34: All

T. 15 N., R. 118 W.,
Sec. 30: E½E½

T. 30 N., R. 118 W.
Sec. 21: Lot 1
Sec. 28: Lot 1, E½NE¼, NE¼SE¼
Sec. 33: Lot 1, SE¼NE¼, E½SE¼

Range 119
T. 12 N., R. 119 W.
Sec. 2: Lot 1, SE¼NE¼, E½SE¼
Sec. 12: W½W½
Sec. 14: E½E½
Sec. 20: Lot 4
Sec. 24: Lot 4, NW¼SW¼, W½NW¼

T. 13 N., R. 119 W.
Sec. 2: Lots 1, 2, S½NE¼, SE¼SE¼
Sec. 6: S½SE¼
Sec. 8: W½, W½E½
Sec. 24: W½W½
Sec. 32: SW¼

T. 14 N., R. 119 W.
Sec. 4: Lots 1, 2, 3, 4, S½N½, S½
Sec. 6: Lots 6, 7, E½SW¼, SE¼
Sec. 8: N½
Sec. 10: E½E½, NW¼NE¼, N½NW¼, SW¼SE¼
Sec. 12: W½W½
Sec. 14: All
Sec. 20: E½E½
Sec. 22: All
Sec. 24: All
Sec. 26: All
Sec. 28: N½, N½S½
Sec. 35: Lots 9, 10, 11

Range 119 (Continued)
T. 15 N., R. 119 W.
Sec. 24: SW¼
Sec. 26: SW¼
Sec. 32: N½NE¼, W½, E½SE¼

T. 18 N., R. 119 W.
Sec. 6: All

T. 30 N., R. 119 W.,
Sec. 2: NE¼SE¼
Sec. 11: S½NE¼
Sec. 12: SW¼NW¼, NW¼SW¼

T. 33 N., R. 119 W.
Sec. 2: Lot 2, SE¼NE¼
Sec. 33: Lots 1, 2, 3, 4

T. 36 N., R. 119 W.
Sec. 14: SE¼NE¼, N½SE¼
Sec. 24: E½E½
Sec. 25: NE¼N¼, S½NE¼, SE¼

Range 120
T. 14 N., R. 120 W.
Sec. 4: Lots 1 to 4 inclusive, S½N½, S½
Sec. 8: S½
Sec. 10: E½E½, NW¼NE¼, NW¼, SW¼SE¼
Sec. 14: All
Sec. 20: All
Sec 24: N½, SW¼
Sec. 26: NE¼NE¼, E½SE¼
Sec. 28: S½
Sec. 30: S½N½, S½

Range 121
T. 13 N., R. 121 W.
Sec. 2: Lot 1
Sec. 10: Lots 2, 3
Sec. 12: NE¼NE¼
Sec. 24: NW¼SE¼

T. 14 N., R. 121 W.
Sec. 12: NW¼NW¼
Sec. 24: S½SE¼
Sec. 26: NE¼, SE¼NW¼, S½S½

T. 15 N., R. 121 W.
Sec. 2: Lots 1, 2, S½NE¼, SE¼
Sec. 11: E½
Sec. 14: N½NE¼, SW¼NE¼, N½SE¼SE¼
Sec. 23: E½
Sec. 34: Lots 1 to 4 inclusive

T. 16 N., R. 121 W.
Sec. 23: E½
Sec. 26: SE¼
Sec. 35: E½

STAR VALLEY AREA

Range 118
T. 30 N., R. 118 W.
Sec. 5: Lot 4

T. 31 N., R. 118 W.
Sec. 18: Lots 1, 2, 3, 4, W½NE¼
Sec. 19: Lot 1

T. 32 N., R. 118 W.
Sec. 31: E½NE¼, NE¼SE¼

T. 33 N., R. 118 W.
Sec. 28: E½SW¼

T. 34 N., R. 118 W.
Sec. 5: Lots 1, 5, 6, 9
Sec. 6: SE¼NE¼
Sec. 27: Lots 2, 3

Range 119
T. 30 N., 119 W.
Sec. 2: NE¼SE¼

T. 31 N., R. 119 W.
Sec. 6: Lots 4, 5, 6
Sec. 7: Lots 1, 4
Sec. 8: Lots 7, 8, SE¼SE¼
Sec. 9: SW¼SW¼
Sec. 17: Lot 7
Sec. 18: Lot 8 (reconveyed U.S.)
Sec. 20: E½SE¼
Sec. 21: W½SW¼

T. 34 N., R. 119 W.
Sec. 22: Lots 3, 4, 5
Sec. 35: Lots 1, 2, 3, 8, 9, NE¼SW¼

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KEMMERER
PROPOSED RESOURCE MANAGEMENT PLAN AND
FINAL ENVIRONMENTAL IMPACT STATEMENT

Appendix H

Standard Oil and Gas Stipulations

Appendix H
Standard Oil and Gas Stipulations

Multiple Mineral Development Stipulation

Operations will not be approved which, in the opinion of the authorized officer, would unreasonably interfere with the orderly development and (or) production from a valid existing mineral lease issued prior to this one for the same lands.

Lease Notice 1

Under Regulation 43 Code of Federal Regulation (CFR) 3101.1 2 and terms of the lease (Bureau of Land Management [BLM] Form 3100 11), the authorized officer may require reasonable measures to minimize adverse impacts to other resource values, land uses, and users not addressed in lease stipulations at the time operations are proposed. Such reasonable measures may include, but are not limited to, modification of siting or design of facilities, timing of operations, and specification of interim and final reclamation measures, which may require relocating proposed operations up to 200 meters, but not off the leasehold, and prohibiting surface-disturbance activities for up to 60 days.

The lands within this lease may include areas not specifically addressed by lease stipulations that may contain special values, may be needed for special purposes, or may require special attention to prevent damage to surface and (or) other resources. Possible special areas are identified below. Any surface use or occupancy within such special areas will be strictly controlled or, if absolutely necessary, prohibited. Appropriate modifications to imposed restrictions will be made for the maintenance and operation of producing wells.

1. Slopes in excess of 25 percent.
2. Within 500 feet of surface water and (or) riparian areas.
3. Construction with frozen material or during periods when the soil material is saturated or when watershed damage is likely to occur.
4. Within 500 feet of Interstate highways and 200 feet of other existing rights of way (i.e., U.S. and state highways, roads, railroads, pipelines, powerlines).
5. Within ¼ mile of occupied dwellings.
6. Material sites.

Guidance

The intent of this notice is to inform interested parties (potential lessees, permittees, operators) that when one or more of the above conditions exist, surface-disturbing activities will be prohibited unless or until the permittee or the designated representative and the surface management agency arrive at an acceptable plan for mitigation of anticipated impacts. This negotiation will occur prior to development and become a condition for approval when authorizing the action.

Specific threshold criteria (e.g., 500 feet from water) have been established based on the best information available. However, geographical areas and time periods of concern must be delineated at the field level (i.e., “surface water and (or) riparian areas” may include both intermittent and ephemeral water sources or may be limited to perennial surface water).

The referenced oil and gas leases on these lands are hereby made subject to the stipulation that the exploration or drilling activities will not interfere materially with the use of the area as a materials site/free use permit. At the time operations on the above lands are commenced, notification will be made to the appropriate agency. The name of the appropriate agency may be obtained from the respective BLM field office.

Lease Notice 2

Background

The BLM, by including National Historic Trails (NHTs) within its National Landscape Conservation System, has recognized these trails as national treasures. The BLM's responsibility is to review the strategy for management, protection, and preservation of these trails. The NHTs in Wyoming, which include the Oregon, California, Mormon Pioneer, and Pony Express Trails, as well as the Nez Perce Trail, were designated by Congress through the National Trails System Act (Public Law [P.L.] 90-543; 16 United States Code [USC] 1241-1251) as amended through P.L. 106-509 dated November 13, 2000. Protection of the NHTs is normally considered under the National Historic Preservation Act (P.L. 89-665; 16 USC 470 et seq.) as amended through 1992 and the National Trails System Act. Additionally, Executive Order 13195, "Trails for America in the 21st Century," signed January 18, 2001, states in Section 1: "Federal agencies will...protect, connect, promote, and assist trails of all types throughout the United States. This will be accomplished by…(b) Protecting the trail corridors associated with national scenic trails and the high priority potential sites and segments of national historic trails to the degrees necessary to ensure that the values for which each trail was established remain intact." Therefore, the BLM will be considering all impacts and intrusions to the NHTs, their associated historic landscapes, and all associated features, such as trail traces, grave sites, historic encampments, inscriptions, natural features frequently commented on by emigrants in journals, letters and diaries, or any other feature contributing to the historic significance of the trails. Additional NHTs will likely be designated amending the National Trails System Act. When these amendments occur, this notice will apply to those newly designated NHTs as well.

Strategy

The BLM will proceed in this objective by conducting a viewshed analysis on either side of the designated centerline of the NHTs in Wyoming, except, at this time, for the Nez Perce Trail, for the purpose of identifying and evaluating potential impacts to the trails, their associated historic landscapes, and their associated historic features. Subject to the viewshed analysis and archeological inventory, reasonable mitigation measures may be applied. These may include, but are not limited to, modification of siting or design of facilities to camouflage or otherwise hide the proposed operations within the viewshed. Additionally, specification of interim and final reclamation measures may require relocating the proposed operations within the leasehold. Surface-disturbing activities will be analyzed in accordance with the National Environmental Policy Act of 1969 (P.L. 91-190; 42 USC 4321-4347) as amended through P.L. 94-52, July 3, 1975, and P.L. 94-83, August 9, 1975, and the National Historic Preservation Act, supra, to determine if any design, siting, timing, or reclamation requirements are necessary). This strategy is necessary until the BLM determines that, based on the results of the completed viewshed analysis and archeological inventory, the existing land use plans (Resource Management Plans) have to be amended.

The use of this lease notice is a predecisional action that is necessary until final decisions regarding surface-disturbing restrictions are made. Final decisions regarding surface-disturbing restrictions will take place with full public disclosure and public involvement over the next several years if BLM determines that it is necessary to amend existing land use plans.

Guidance

The intent of this notice is to inform interested parties (potential lessees, permittees, operators) that when any oil and gas lease contains remnants of NHTs, or is located within the viewshed of an NHTs' designated centerline, surface-disturbing activities will require the lessee, permittee, operator or their designated representative, and the surface management agency to arrive at an acceptable plan for mitigation of anticipated impacts. This negotiation will occur prior to development and become a condition for approval when authorizing the action.

SPECIAL LEASE STIPULATION

This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any ground disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated. Lease Notice 3

Greater Sage-Grouse Habitat

The lease may in part, or in total, contain important Sage-Grouse habitats as identified by the BLM, either currently or prospectively. The operator may be required to implement specific measures to reduce impacts of oil and gas operations on the Sage-Grouse populations and habitat quality. Such measures shall be developed during the Application for Permit to Drill (APD) on-site and environmental review process and will be consistent with the lease rights granted.

Offer to Lease and Lease for Oil and Gas (Form 3100-11, July 2006)

LEASE TERMS

Sec. 1. Rentals - Rentals must be paid to proper office of lessor in advance of each lease year. Annual rental rates per acre or fraction thereof are:

(a) Noncompetitive lease, $1.50 for the first 5 years; thereafter $2.00;

(b) Competitive lease, $1.50; for the first 5 years; thereafter $2.00;

(c) Other, see attachment, or as specified in regulations at the time this lease is issued.

If this lease or a portion thereof is committed to an approved cooperative or unit plan which includes a well capable of producing leased resources, and the plan contains a provision for allocation of production, royalties must be paid on the production allocated to this lease. However, annual rentals must continue to be due at the rate specified in (a), (b), or (c) rentals for those lands not within a participating area.

Failure to pay annual rental, if due, on or before the anniversary date of this lease (or next official working day if office is closed) must automatically terminate this lease by operation of law. Rentals may be waived, reduced, or suspended by the Secretary upon a sufficient showing by lessee.

See. 2. Royalties - Royalties must be paid to proper office of lessor. Royalties must be computed in accordance with regulations on production removed or sold. Royalty rates are:

(a) Noncompetitive lease, 12 1/2%

(b) Competitive lease, 12 1/2 %

(c) Other, see attachment; or as specified in regulations at the time this lease is issued.

Lessor reserves the right to specify whether royalty is to be paid in value or in kind, and the right to establish reasonable minimum values on products after giving lessee notice and an opportunity to be heard. When paid in value, royalties must be due and payable on the last day of the month following the month in which production occurred. When paid in kind, production must be delivered, unless otherwise agreed to by lessor, in merchantable condition on the premises where produced without cost to lessor. Lessee must not be required to hold such production in storage beyond the last day of the month following the month in which production occurred, nor must lessee be held liable for loss or destruction of royalty oil or other products in storage from causes beyond the reasonable control of lessee.

Minimum royalty in lieu of rental of not less than the rental which otherwise would be required for that lease year must be payable at the end of each lease year beginning on or after a discovery in paying quantities. This minimum royalty may be waived, suspended, or reduced, and the above royalty rates may be reduced, for all or portions of this lease if the Secretary determines that such action is necessary to encourage the greatest ultimate recovery of the leased resources, or is otherwise justified.

An interest charge will be assessed on late royalty payments or underpayments in accordance with the Federal Oil and Gas Royalty Management Act of 1982 (FOGRMA) (30 U.S.C. 1701). Lessee must be liable for royalty payments on oil and gas lost or wasted from a lease site when such loss or waste is due to negligence on the part of the operator, or due to the failure to comply with any rule, regulation, order, or citation issued under FOGRMA or the leasing authority.

Sec. 3. Bonds - A bond must be filed and maintained for lease operations as required under regulations.

Sec. 4. Diligence, rate of development, unitization, and drainage - Lessee must exercise reasonable diligence in developing and producing, and must prevent unnecessary damage to, loss of, or waste of leased resources. Lessor reserves right to specify rates of development and production in the public interest and to require lessee to subscribe to a cooperative or unit plan, within 30 days of notice, if deemed necessary for proper development and operation of area, field, or pool embracing these leased lands. Lessee must drill and produce wells necessary to protect leased lands from drainage or pay compensatory royalty for drainage in amount determined by lessor.

Sec. 5. Documents, evidence, and inspection - Lessee must file with proper office of lessor, not later than 30 days after effective date thereof, any contract or evidence of other arrangement for sale or disposal of production. At such times and in such form as lessor may prescribe, lessee must furnish detailed statements showing amounts and quality of all products removed and sold, proceeds there from, and amount used for production purposes or unavoidably lost. Lessee may be required to provide plats and schematic diagrams showing development work and improvements, and reports with respect to parties in interest, expenditures, and depreciation costs. In the form prescribed by lessor, lessee must keep a daily drilling record, a log, information on well surveys and tests, and a record of subsurface investigations and furnish copies to lessor when required. Lessee must keep open at all reasonable times for inspection by any representative of lessor, the leased premises and all wells, improvements, machinery, and fixtures thereon, and all books, accounts, maps, and records relative to operations, surveys, or investigations on or in the leased lands. Lessee must maintain copies of all contracts, sales agreements, accounting records, and documentation such as billings, invoices, or similar documentation that supports costs claimed as manufacturing, preparation, and/or transportation costs. All such records must be maintained in lessee's accounting offices for future audit by lessor. Lessee must maintain required records for 6 years after they are generated or, if an audit or investigation is underway, until released of the obligation to maintain such records by lessor.

During existence of this lease, information obtained under this section will be closed to inspection by the public in accordance with the Freedom of Information Act (5 U.S.C. 552).

Sec. 6. Conduct of operations - Lessee must conduct operations in a manner that minimizes adverse impacts to the land, air, and water, to cultural, biological, visual, and other resources, and to other land uses or users. Lessee must take reasonable measures deemed necessary by lessor to accomplish the intent of this section. To the extent consistent with lease rights granted, such measures may include, but are not limited to, modification to siting or design of facilities, timing of operations, and specification of interim and final reclamation measures. Lessor reserves the right to continue existing uses and to authorize future uses upon or in the leased lands, including the approval of easements or rights-of-way. Such uses must be conditioned so as to prevent unnecessary or unreasonable interference with rights of lessee.

Prior to disturbing the surface of the leased lands, lessee must contact lessor to be apprised of procedures to be followed and modifications or reclamation measures that may be necessary. Areas to be disturbed may require inventories or special studies to determine the extent of impacts to other resources. Lessee may be required to complete minor inventories or short term special studies under guidelines provided by lessor. If in the conduct of operations, threatened or endangered species, objects of historic or scientific interest, or substantial unanticipated environmental effects are observed, lessee must immediately contact lessor. Lessee must cease any operations that would result in the destruction of such species or objects.

Sec. 7. Mining operations - To the extent that impacts from mining operations would be substantially different or greater than those associated with normal drilling operations, lessor reserves the right to deny approval of such operations.

Sec. 8. Extraction of helium - Lessor reserves the option of extracting or having extracted helium from gas production in a manner specified and by means provided by lessor at no expense or loss to lessee or owner of the gas. Lessee must include in any contract of sale of gas the provisions of this section.

Sec. 9. Damages to property - Lessee must pay lessor for damage to lessor's improvements, and must save and hold lessor harmless from all claims for damage or harm to persons or property as a result of lease operations.

Sec. 10. Protection of diverse interests and equal opportunity – Lessee must pay, when due, all taxes legally assessed and levied under laws of the State or the United States; accord all employees complete freedom of purchase; pay all wages at least twice each month in lawful money of the United States; maintain a safe working environment in accordance with standard industry practices; and take measures necessary to protect the health and safety of the public.

Lessor reserves the right to ensure that production is sold at reasonable prices and to prevent monopoly. If lessee operates a pipeline, or owns controlling interest in a pipeline or a company operating a pipeline, which may be operated accessible to oil derived from these leased lands, lessee must comply with section 28 of the Mineral Leasing Act of 1920.

Lessee must comply with Executive Order No. 11246 of September 24, 1965, as amended, and regulations and relevant orders of the Secretary of Labor issued pursuant thereto. Neither lessee nor lessee's subcontractors must maintain segregated facilities.

Sec. 11. Transfer of lease interests and relinquishment of lease – As required by regulations, lessee must file with lessor any assignment or other transfer of an interest in this lease. Lessee may relinquish this lease or any legal subdivision by filing in the proper office a written relinquishment, which will be effective as of the date of filing, subject to the continued obligation of the lessee and surety to pay all accrued rentals and royalties.

Sec. 12. Delivery of premises - At such time as all or portions of this lease are returned to lessor, lessee must place affected wells in condition for suspension or abandonment, reclaim the land as specified by lessor and, within a reasonable period of time, remove equipment and improvements not deemed necessary by lessor for preservation of producible wells.

Sec. 13. Proceedings in case of default - If lessee fails to comply with any provisions of this lease, and the noncompliance continues for 30 days after written notice thereof, this lease will be subject to cancellation unless or until the leasehold contains a well capable of production of oil or gas in paying quantities, or the lease is committed to an approved cooperative or unit plan or communitization agreement which contains a well capable of production of unitized substances in paying quantities. This provision will not be construed to prevent the exercise by lessor of any other legal and equitable remedy, including waiver of the default. Any such remedy or waiver will not prevent later cancellation for the same default occurring at any other time. Lessee will be subject to applicable provisions and penalties of FOGRMA (30 U.S.C. 1701).

Sec. 14. Heirs and successors-in-interest - Each obligation of this lease will extend to and be binding upon, and every benefit hereof will inure to the heirs, executors, administrators, successors, beneficiaries, or assignees of the respective parties hereto.

Attachment to Each Lease

Notice to Lessee

Provisions of the Mineral Leasing Act (MLA) of 1920, as amended by the Federal Coal Leasing Amendments Act of 1976, affect an entity's qualifications to obtain an oil and gas lease. Section 2(a)(2)(A) of the MLA, 30 USC 201 (a)(2)(A), requires that any entity that holds and has held a federal coal lease for 10 years beginning on or after August 4, 1976, and who is not producing coal in commercial quantities from each such lease, cannot qualify for the issuance of any other lease granted under the MLA. Compliance by coal lessees with Section 2(a)(2)(A) is explained in 43 CFR 3472.

In accordance with the terms of this oil and gas lease, with respect to compliance by the initial lessee with qualifications concerning federal coal lease holdings, all assignees and transferees are hereby notified that this oil and gas lease is subject to cancellation if (1) the initial lessee as assignor or as transferor has falsely certified compliance with Section 2(a)(2)(A), or (2) because of a denial or disapproval by a state office of a pending coal action; i.e., arms-length assignment, relinquishment, or logical mining unit, or the initial lessee as assignor or as transferor is no longer in compliance with Section 2(a)(2)(A). The assignee, sublessee, or transferee does not qualify as a bona fide purchaser and, thus, has no rights to bona fide purchaser protection in the event of cancellation of this lease due to noncompliance with Section 2(a)(2)(A).

Information regarding assignor, sublessor, or transferor compliance with Section 2(a)(2)(A) is contained in the lease case file, as well as in other BLM records available through the state office issuing this lease.

KEMMERER
PROPOSED RESOURCE MANAGEMENT PLAN AND
FINAL ENVIRONMENTAL IMPACT STATEMENT

Appendix I

Recreation and Travel Management

APPENDIX I
RECREATION AND TRAVEL MANAGEMENT

1.0 Recreation Matrices

The following tables summarize the proposed Recreation Management Areas in the Kemmerer planning area. Special Recreation Management Areas (SRMAs) are Bureau of Land Management (BLM) administrative units established to direct recreation program priorities, including the allocation of funding and personnel, to those public lands where a commitment has been made to provide specific recreation activity and experience opportunities on a sustained yield basis. This includes a long-term commitment to manage the physical, social, and managerial settings to sustain these activity and experience opportunities. Delineation is based on administrative/management criteria including the existence of Congressional designations, similar or interdependent recreation values, homogenous or interrelated recreation uses, land-tenure and use patterns, transportation systems, administrative efficiency, intensity of use, high resource values, public concerns, or interagency considerations. These areas usually require a high level of recreation investment and (or) management. They include recreation sites, but recreation sites alone do not constitute a SRMA.

Pine Creek Canyon
Special Recreation Management Area

Primary Market Strategy	Market
Community	Primarily Local Residents and Visitors from adjacent states

Niche
Camping, picnicking, hiking, snowmobiling, and driving for pleasure

Recreation Management Objective
To provide opportunities for visitors to engage in targeted activities to achieve experiences and benefits as indicated below. Maintain setting character as outlined below.

Targeted Outcomes		
Primary Activities	**Experiences**	**Benefits**
Picnicking	Being with friends & family	**Personal:** • Nature/aesthetic appreciation • Positive change in mood and emotion • Social bonding/cohesion/cooperation • Identification with a special place **Community:** • Improved perceived quality of life • Family bonding/better family life • Improved image of the area and its recreational opportunities • Improved image of land management agencies **Environmental:** • Creates sense of "ownership" and stewardship of the area • Better preservation of forest & riparian environment **Economic:** • Contribution to Recreation & Tourism Sector of the local economy • Retains recreation spending in local area • Increased attractiveness of Wyoming as a place to relocate
Camping	Relaxing physically	
Driving for Pleasure	Enjoying scenery & natural setting	
Snowmobiling	Enjoying leisure activities	
Hiking		
Hunting		

Prescribed Setting Character		
Physical	**Social**	**Administrative**
Remoteness: Front Country (near improved roads) **Naturalness:** Middle Country (natural appearing landscapes) **Facilities:** Middle Country (Developed recreation facilities designed to facilitate access & use of the area)	**Contacts:** Middle/Front Country (2-7 encounters/day. **Group Size:** Back Country (4-6 people per group) **Evidence of Use:** Front Country (Vehicle tracks common, some noise & litter, vegetation commonly worn around public facilities)	**Mechanized Use:** Front Country (Two & four wheel drive vehicles, ATV snowmobiles & non-motorized/mechanized travel) **Visitor Services:** Front Country (Regulatory/information signs, OHV limitations) **Management:** Front Country (Information materials available at developed sites. Agency personnel occasionally onsite, occasional regulatory signing, periodic enforcement presence)

Implementation Strategy/Actions	
Administrative	Provide developed camping and other facilities as needed. Snowmobiling will be managed according to the Pine Creek Snowmobile EA, completed in 2004. SRPs will be evaluated for recreation/outdoor education and for commercial activities for qualified hunting guides. On developed recreation sites, unless specifically authorized, no person shall discharge firearms, other weapons, projectiles, or fireworks. The Pine Creek SRMA would be managed as VRM Class II; OHV – Motor vehicles limited to designated roads & trails.
Management	Campground fees may be charged in the future. Current facilities include one bathroom and several campsites. Snowmobiling is restricted to Pine Creek Road. The development of new facilities will be evaluated as demand dictates.
Marketing	Support active volunteer programs and develop new partnerships (e.g., National Public Lands Day and National Trails Day events and volunteer projects for local groups).
Monitoring	Monitor monthly through most of the year and weekly during the hunting seasons; water samples will be taken monthly; soil disturbance caused by OHVs will be reported to law enforcement; any SRPs issued will be monitored daily; camping use will be monitored to prevent degradation of riparian areas and water quality. Routine monitoring of physical facilities and visitor number collections will continue to include a counter, and periodic visitor surveys will assess achievement of management objectives.

Raymond Mountain Wilderness Study Area
Special Recreation Management Area

Primary Market Strategy	Market
Destination and Community	Visitors and Local Residents

Raymond Mountain Wilderness Study Area SRMA: Back Country Zone
Niche
Primarily hunting, back packing, hiking, primitive camping, trailhead facilities, access point to Raymond WSA
Recreation Management Objective
Manage this Back Country Zone to provide high quality hiking, back packing and hunting along with informational trailhead facilities at the access point to Raymond Mountain WSA to provide targeted experiences and benefits. Maintain setting character as outlined below.

Targeted Outcomes		
Primary Activities	**Experiences**	**Benefits**
Trailhead for Back Country and Access to Raymond Mountain WSA Hunting Primitive Camping Picnicking/Day Use Viewing Wildlife/Natural Scenery Rock Climbing	Enjoying viewing natural scenery Relaxing physically Engaging in preferred activities with family & friends	**Personal:** • Nature/aesthetic appreciation • Positive change in mood and emotion • Social bonding/cohesion/cooperation • Personal health & fitness **Community:** • Improved perceived quality of life • Family bonding/better family life • Better appreciation of Raymond Mountain WSA • Improved image of land management agencies **Environmental:** • Public learns environmental stewardship • Better preservation of Raymond Mountain WSA **Economic:** • Contribution to Recreation & Tourism Sector of the local economy

Prescribed Setting Character		
Physical	**Social**	**Administrative**
Remoteness: Back Country **Naturalness:** Back Country Natural landscape **Facilities:** Back Country signage at trailheads	**Contacts:** Back Country (fewer than 3 encounters/day) **Group Size**: Back Country fewer than 3 per group **Evidence of Use:** Back Country slight vegetation trampling near camp sites, fire rings **Types of Encounters:** Back Country	**Mechanized Use**: Back Country none **Visitor Services:** Back Country signs at key access points **Management Controls:** Back Country Basic maps **Domestic Animals**: Middle Country

Implementation Strategy/Actions	
Administrative	Maintain trails
Management	Continue to manage WSA under IMP, Closed to OHV, VRM Class I
Marketing	Word of mouth only
Monitoring	Monitor WSA boundary monthly; weekly monitoring during the deer and elk hunting seasons. Any OHV use in the WSA will be reported to law enforcement immediately; any SRPs issued will be monitored weekly. Routine monitoring of trails and use; occasional visitor contact to assess achievement of objectives.

Oregon-California National Historic Trails
Special Recreation Management Area

Includes Oregon and California National Historic Trails

Primary Market Strategy	Market
Destination and Community	Local Residents and National and International Visitors

Niche
Historic preservation, education/interpretation

Recreation Management Objective
Manage the Oregon-California National Historic Trails SRMA to provide opportunities for visitors to engage in targeted activities in preferred settings to achieve experiences & benefits indicated below. Preserve the physical remains of historic trails and, where possible, the physical setting in which the trails are located.

Targeted Outcomes		
Primary Activities	**Experiences**	**Benefits**
Driving/Touring for Pleasure Viewing Historic Sites Learning about the History of the Area Living History Heritage Education and Tourism	Viewing historic trail remains in a natural setting Studying and learning about the history of the area Engaging in preferred activities with family & friends Feeling good about the way our cultural heritage is being protected & interpreted	**Personal:** • Nature/aesthetic/historic appreciation • Greater respect for cultural heritage • Social bonding/cohesion/cooperation • Identification with a special place • Better understanding of pioneer's contribution to our way of life **Community:** • Improved perceived quality of life • Improved image of the area and its history **Environmental:** • Creates sense of ownership and stewardship of cultural/historical resources of the area • Greater protection of the area's cultural/historical resources **Economic:** • Contribution to Recreation & Tourism Sector of the local economy • Retains recreation spending in local area • Increased attractiveness of Wyoming as a place to live

Prescribed Setting Character		
Physical	**Social**	**Administrative**
Remoteness: Middle Country found North of Kemmerer– Rural found nearer gas fields and towns) **Naturalness:** Middle Country - Rural (natural appearing – developed landscapes) **Facilities:** Middle Country – Rural (maintained roads, interpretive signage, campgrounds)	**Contacts:** Middle – Rural 3-5 contacts/day **Group Size:** Middle Country Rural 2-6 people per group **Evidence of Use:** Middle Country – Rural Some vehicle tracks	**Mechanized Use:** Middle Country four wheel drive prominent **Visitor Services:** Middle Country – Rural Area personnel are periodically available **Management Controls:** Middle Country periodic enforcement presence

Implementation Strategy/Actions	
Administrative	Encourage and develop cooperative partnerships with volunteer groups, land owners and other land management agencies to facilitate responsible recreational use of the area. SRPs may be allowed for commercial, non-commercial, and competitive events on a case-by-case basis.
Management	Maintain integrity of setting for significant and appropriate trail segments. Developments such as access/interpretation would be authorized as needed. Conform to recommendations in revised statewide Historic Trails Management Plan.
Marketing	Information/directional signs and interpretation along the corridor, as appropriate. Develop brochures for the area and upgrade the Internet site that describes the area.
Monitoring	Monitor any SRPs issued daily; monitor for any physical change within the SRMA boundary. Soil disturbance caused by OHVs will be reported to law enforcement; respond to public complaints. Monitor condition of trail segments and associated sites every 2 years or as appropriate. Monitor visitor use registration forms and periodic visitor surveys to assess achievement of management objectives.

Dempsey Ridge Special Recreation Management Area

Primary Market Strategy	Market
Destination/ Community	Residents and National and International Visitors

Niche
Driving/touring for pleasure, hunting, camping, historic interpretation

Recreation Management Objective
By 2010, manage this area to provide opportunities for visitors to engage in targeted activities, providing no less than 90 percent of visitors a realization of targeted benefits.

Targeted Outcomes		
Primary Activities	**Experiences**	**Benefits**
Driving/Touring for Pleasure Camping Hunting Viewing Wildlife/Natural Scenery Horseback Riding Heritage Tourism Visiting Historic Trails and Sites	Being with friends and family Enjoying natural scenery and wildlife Enjoying leisure activities in a natural setting Testing and improving driving skills Reestablishing connections to past	**Personal:** • Positive change in mood and emotion • Social bonding/cohesion/cooperation • Natural /aesthetic appreciation • Identification with special place **Community/Social:** • Improved perceived quality of life • Social bonding • Improved image of area and its recreational opportunities **Environmental:** • Creates sense of "ownership" and stewardship of the historic area • Provides natural habitat and open space **Economic:** • Retains recreation spending in local area • Increased contribution to the local economies • Increased attractiveness of Wyoming as a place to relocate

Prescribed Setting Character		
Physical	**Social**	**Administrative**
Remoteness: Middle Country (on and near four-wheel drive road) **Naturalness: Middle Country** (natural landscape except primitive road) **Facilities: Front Country** (maintained road, interpretive signage, fences around graves)	**Contacts: Primitive Country** (fewer than 3 encounters/day) **Group Size: Primitive Country** 2 to 4 **Evidence of Use: Back Country** Noise and litter infrequent, Vegetation tramping near sites	**Mechanized Use:** Middle Country Four-wheel vehicles predominate, ATV and nonmotorized travel **Management :** Signs at key access points, enforcement rare **Visitor Services:** Basic maps but information rarely available on site

Implementation Strategy/Actions	
Administrative	Encourage and develop cooperative relationships with volunteer groups, landowners and other land management agencies to facilitate responsible recreational use of the area. SRP will be allowed for commercial, noncommercial and competitive on a case-by-case basis. Maintain the interpretive signs at both graves.
Management	Most of the area will be managed as VRM class II and NSO for fluid minerals within ¼ mile of trails. Maintain existing facilities include two graves and 20 miles of improved roads.
Marketing	Develop cooperative relationships with local groups, upgrade Internet site describing the site and continue to make brochures of the area available off site.
Monitoring	SRPs will be monitored weekly. Routine monitoring of physical facilities, and trails, visitor number collections will continue to include registration forms; periodic visitor surveys to assess achievement of goals.

Remainder of the Kemmerer Planning Area
Extensive Recreation Management Area

Primary Market Strategy	Market
Destination and Community	Local Residents and Visitors

Niche
Driving/touring for pleasure, hunting, camping, fishing, four-wheeling

Recreation Management Objective
By 2010, manage this zone to provide opportunities for visitors to engage in targeted activities, providing no less than 70 percent of visitors a realization of targeted benefits.

Targeted Outcomes		
Primary Activities	**Experiences**	**Benefits**
Driving/Touring for pleasure Camping Hunting Fishing Viewing Wildlife/Natural Scenery Horseback Riding Cross-country Skiing Four-Wheeling	Being with friends and family Enjoying natural scenery and wildlife Enjoying leisure activities in a natural setting Testing and improving outdoor skills	**Personal:** • Positive change in mood and emotion • Social bonding/cohesion/cooperation • Natural/aesthetic appreciation • Identification with special place **Community/Social:** • Improved perceived quality of life • Social bonding • Improved image of area and its recreational opportunities **Environmental:** • Creates sense of ownership and stewardship of the area • Provides natural habitat and open space **Economic:** • Retains recreation spending in local area • Increased contribution to the local economies • Increased attractiveness of Wyoming as a place to relocate

Prescribed Setting Character		
Physical	**Social**	**Administrative**
Remoteness: Primitive -Urban on and near four-wheel drive roads(mixed) **Naturalness: Primitive-Urban** (mixed)gas field and natural landscape with primitive road **Facilities: Primitive-Urban** (mixed)	**Contacts: 2-6 encounters/day** (ranges greatly) **Group Size:** Primitive-Urban 2-6 people per group **Evidence of Use:** Primitive-Urban (ranges greatly)Occasional noise and litter	**Mechanized Use:** Primitive-Urban All types of travel found four-wheel vehicles predominate **Management :** Back-Front Country (ranges greatly)personnel occasionally onsite **Visitor Services:** Back-Front Country (ranges greatly)

Implementation Strategy/Actions	
Administrative	Work with private landowners and other land management agency to improve access. Allow for commercial, non-commercial and commercial SRPs and would allow for competitive OHV trails events on a case-by-case basis.
Management	Provide regulatory and interpretive signs where appropriate and funding allows.
Marketing	Develop cooperative relationships with local groups, upgrade Internet site describing the area.
Monitoring	Periodically review tourist's surveys completed by state and local groups; monitor access and recreational complaints. Note the establishment of any additional new two-track routes. Monitor SRPs and OHV events. Map any new roads and trails.

2.0 Natural Resource Recreation Settings

Table I-1 represents a generalized conceptual framework of available recreation settings. Within the desired recreation setting, recreation management actions are prescribed to achieve targeted activities, experiences, and benefits.

Table I-1. Natural Resource Recreation Settings: Criteria for Classification and Prescriptions

	Primitive		Back Country	Middle Country	Front Country	Rural	Urban
	Pristine	Transition					
Physical – Resources & Facilities: ***Character of the natural landscape***							
a. **Remoteness**	More than 10 miles from any road	More than 3 miles from any road	More than ½ mile from any kind of road, but not as distant as 3 miles, and no road is in sight	On or near four-wheel drive roads, but at least ½ mile from all improved roads, though they may be in sight	On or near improved country roads, but at least ½ mile from all highways	On or near primary highways, but still within a rural area	On or near primary highways, municipal streets, and roads within towns or cities
b. **Naturalness**	Undisturbed natural landscape		Naturally appearing landscape having modifications not readily noticeable	Naturally appearing landscape, except for obvious primitive roads	Landscape partially modified by roads, utility lines, etc., but none overpower natural landscape features	Natural landscape substantially modified by agriculture or industrial development	Urbanized developments dominate this landscape
c. **Facilities**	None		Some primitive trails made of native materials, such as log bridges and carved wooden signs	Maintained and marked trails, simple trailhead developments, improved signs, and very basic toilets	Improved, yet modest, rustic facilities, such as campgrounds, restrooms, trails, and interpretive signs	Modern facilities, such as campgrounds, group shelters, boat launches, and occasional exhibits	Elaborate full-service facilities, such as laundry, groceries, and book stores
Social – Visitor Use & Users: ***Character of recreation and tourism use***							
d. **Group Size** (other than your own)	Fewer than or equal to three people per group		Four to six people per group	7-12 people per group	13-25 people per group	26-50 people per group	Greater than 50 people per group
e. **Contacts** (with other groups)	Fewer than three encounters/day at campsites and fewer than six encounters/day on travel routes		Three to six encounters/day off travel routes (campsites) and 7-15 encounters/day on travel routes	7-14 encounters/day off travel routes (e.g., staging areas) and 15-29 encounters/day en route	15-29 encounters/day off travel routes (e.g., campgrounds) and 30 or more encounters/day en route	People seem to be everywhere, but human contact is still intermittent	Other people constantly in view
f. **Types of Encounters**	Users plan trips to avoid others altogether	Take evasive actions for face-to-face avoidance	Users step aside to avoid unsafe conditions or user conflicts, sometimes grudgingly	Users may be unnerved but may not necessarily move off routes, areas, or sites to accommodate others	Users here routinely expect, welcome, and accommodate other visitors	Because crowd tolerance is a necessary condition for being here, encounters tend to be impersonal	People accept, but routinely ignore, multiple crowd interactions
g. **Personal Gear & Equipment**	Very basic gear, cell phones usually don't work here	Convenience gear (cell phones) but not radios	Expect hiking, climbing, and mountain bike gear (e.g., colorful sportswear, bicycle helmets, etc.), radios also may be playing	Expect to see gear associated with vehicle or off-highway vehicle use (e.g., coolers, body armor, etc.), radios and music also	Variety of traditional camper trailers, pop-up tents and conventional tents, radios and music common	Upscale motor homes common, dependant on utility hookups or having generators to support home conveniences and gadgetry	Very specialized gear dependent on service provider assistance (e.g., boat slips, grounds keepers, caretakers)

Table I-1. Natural Resource Recreation Settings: Criteria for Classification and Prescriptions *(Continued)*

	Primitive		Back Country	Middle Country	Front Country	Rural	Urban
	Pristine	Transition					
h. **Evidence of Use**	Only footprints may be observed		Footprints plus slight vegetative trampling at campsites and travel routes, only infrequent litter	Vehicle tracks and occasional litter and soil erosion, vegetation becoming worn	Well-worn soils and vegetation, but often gravel surfaced for erosion control	Paved routes protect soils and vegetation, but noise, litter, and facility impacts are pervasive	A busy place with what seems like constant noise; unavoidable litter seems to be a lifestyle choice
Administrative – *Administrative & Service Setting*: How Public Land Managers, County Commissioners and Municipal Governments, and Local Businesses Care for the Area and Serve Visitors and Local Residents							
i. **Visitor Services**	None is available onsite		Basic maps, but area personnel seldom available to provide onsite assistance	Area brochures & maps, plus area personnel occasionally present to provide onsite assistance	Information materials describe recreational areas and activities, area personnel are periodically available	Everything described to the left in this row area; personnel give onsite education	Everything described to the left in this row, plus regularly scheduled on-site outdoor skills, demonstrations, and clinics
j. **Management Controls**	No visitor controls apparent, enforcement presence very rare		Signs at key access points on basic user ethics; may have back-country user restrictions; enforcement presence rare	Occasional regulatory signing; motorized and mechanized use restrictions; random enforcement presence	Rules clearly posted with some seasonal or day-of-week use restrictions; periodic enforcement presence	Regulations prominent; total use limited by permit, reservation, etc; routine enforcement presence	Continuous enforcement to redistribute use and reduce user conflicts, hazards, and resource damage
k. **Domestic Animals**	No domestic animals allowed	Dogs and pack livestock on designated routes in designated areas only	Livestock (horses and llamas) allowed but, only on designated routes and areas. Dogs under control and pack routes	No controls on dogs and pack livestock other than standard regulations prohibiting wildlife harassment, etc.	Dogs on leashes and pack livestock only in designated areas within recreation sites; both under control elsewhere	Dogs on leashes everywhere and pack livestock allowed only in designated areas	Dogs on leashes everywhere and pack livestock allowed only under specific use restrictions (e.g., horse diapers, parades)
l. **Individual User Fees**	No individual user fees		Individual user fees charged within certain back-country areas	Additional fees charged individuals at some developed recreational sites, but not for any dispersed recreation uses	Individual user fees charged at all developed sites, but not yet for any dispersed recreation use	Individual user fees charged at all developed sites and for dispersed use within high-use areas only	Individual user fees routinely charged for recreation use
m. **Mechanized Use**	None		Mountain bikes and perhaps other mechanized use, but all are nonmotorized	Four-wheel drives, all terrain vehicles, dirt bikes or snowmobiles, in addition to non-motorized, mechanized use	Two-wheel drive vehicles predominant, but also four-wheel drives and non-motorized, mechanized use	Ordinary highway auto and truck traffic is characteristic	Wide variety of street vehicles and highway traffic is ever-present

Table I-1. Natural Resource Recreation Settings: Criteria for Classification and Prescriptions *(Continued)*

	Primitive						
	Pristine	**Transition**	**Back Country**	**Middle Country**	**Front Country**	**Rural**	**Urban**
Physical – Resources & Facilities: *Character of the natural landscape*							
a. **Remoteness**	More than 10 miles from any road	More than 3 miles from any road	More than ½ mile from any kind of road, but not as distant as 3 miles, and no road is in sight	On or near four-wheel drive roads, but at least ½ mile from all improved roads, though they may be in sight	On or near improved country roads but at least ½ mile from all highways	On or near primary highways, but still within a rural area	On or near primary highways, municipal streets, and roads within towns or cities
b. **Naturalness**	Undisturbed natural landscape		Naturally appearing landscape having modifications not readily noticeable	Naturally appearing landscape, except for obvious primitive roads	Landscape partially modified by roads, utility lines, etc., but none overpower natural landscape features	Natural landscape substantially modified by agriculture or industrial development	Urbanized developments dominate this landscape
c. **Facilities**	None		Some primitive trails made of native materials, such as log bridges and carved wooden signs	Maintained and marked trails, simple trailhead developments, improved signs, and very basic toilets	Improved, yet modest, rustic facilities, such as campgrounds, restrooms, trails, and interpretive signs, primitive and developed boat launches	Modern facilities, such as campgrounds, group shelters, boat launches, and occasional exhibits	Elaborate full-service facilities, such as laundry, groceries, and book stores
Social – Visitor Use & Users: *Character of recreation and tourism use*							
d. **Group Size** (other than own)	Fewer than or equal to three people per group		Four to six people per group	7-12 people per group	13-25 people per group	26-50 people per group	Greater than 50 people per group
e. **Contacts** (with other groups)	Fewer than three encounters/day at campsites and fewer than six encounters/day on travel routes		Three to six encounters/day off travel routes (campsites) and 7-15 encounters/day on travel routes	7-14 encounters/day off travel routes (e.g., staging areas) and 15-29 encounters/day en route	15-29 encounters/day off travel routes (e.g., campgrounds) and 30 or more encounters/day en route	People seem to be everywhere, but human contact is still intermittent	Other people constantly in view
f. **Types of Encounters**	Users plan trips to avoid others altogether	Users take evasive actions for face-to-face avoidance	Users step aside to avoid unsafe conditions or user conflicts, sometimes grudgingly	Users may be unnerved but may not necessarily move off routes, areas, or sites to accommodate others	Users here routinely expect, welcome, and accommodate other visitors	Because crowd tolerance is a necessary condition for being here, encounters tend to be impersonal	Here people accept but routinely ignore multiple crowd interactions
g. **Personal Gear and Equipment**	Very basic gear, cell phones usually don't work here	Convenience gear (cell phones), but not radios	Expect hiking, climbing, and mountain bike gear (e.g., colorful sportswear, bicycle helmets, etc.); radios also may be playing	Expect to see gear associated with vehicle or off-highway vehicle use (e.g., coolers, body armor, etc.); radios and music also	Variety of traditional camper trailers, pop-up tents and conventional tents, radios, and music common	Upscale motor homes common, dependant on utility hookups or having generators to support home conveniences and gadgetry	Very specialized gear dependent on service provider assistance (e.g., boat slips, grounds keepers, caretakers)

Table I-1. Natural Resource Recreation Settings: Criteria for Classification and Prescriptions *(Continued)*

	Primitive						
	Pristine	Transition	Back Country	Middle Country	Front Country	Rural	Urban
h. **Evidence of Use**	Only footprints may be observed		Footprints plus slight vegetative trampling at campsites and travel routes; only infrequent litter	Vehicle tracks and occasional litter and soil erosion; vegetation becoming worn	Well-worn soils and vegetation, but often gravel surfaced for erosion control	Paved routes protect soils and vegetation, but noise, litter and facility impacts are pervasive	A busy place with what seems like constant noise, unavoidable litter seems to be a lifestyle choice
Administrative – Administrative & Service Setting: How Public Land Managers, County Commissioners and Municipal Governments, and Local Businesses Care for the Area and Serve Visitors and Local Residents							
i. **Visitor Services**	None is available onsite		Basic maps, but area personnel seldom available to provide on-site assistance	Area brochures and maps, plus area personnel occasionally present to provide on-site assistance	Information materials describe recreational areas and activities; area personnel are periodically available	Everything described to the left in this row, area personnel give onsite education	Everything described to the left in this row, plus regularly scheduled on-site outdoor skills, demonstrations, and clinics
j. **Management Controls**	No visitor controls apparent; enforcement presence very rare		Signs at key access points on basic user ethics; may have back-country user restrictions; enforcement presence rare	Occasional regulatory signing; motorized and mechanized use restrictions; random enforcement presence	Rules clearly posted with some seasonal or day-of-week use restrictions; periodic enforcement presence	Regulations prominent; total use limited by permit, reservation, etc.; routine enforcement presence	Continuous enforcement to redistribute use and reduce user conflicts, hazards, and resource damage
k. **Domestic Animals**	No domestic animals allowed	Dogs and pack livestock on designated routes in designated areas only	Livestock (horses and llamas) allowed, but only on designated routes and areas. Dogs under control and pack routes	No controls on dogs and pack livestock other than standard regulations prohibiting wildlife harassment, etc.	Dogs on leashes and pack livestock only in designated areas within recreation sites; both under control elsewhere	Dogs on leashes everywhere and pack livestock allowed only in designated areas	Dogs on leashes everywhere and pack livestock allowed only under specific use restrictions (e.g., horse diapers, parades)
l. **Individual User Fees**	No individual user fees		Individual user fees charged within certain back-country areas	Additional fees charged individuals at some developed recreational sites, but not for any dispersed recreation uses	Individual user fees charged at all developed sites, but not yet for any dispersed recreation use	Individual user fees charged at all developed sites and for dispersed use within high-use areas only	Individual user fees routinely charged for recreation use
m. **Mechanized Use**	None		Mountain bikes and perhaps other mechanized use, but all are nonmotorized	Four-wheel drives, all terrain vehicles, dirt bikes, or snowmobiles ,in addition to nonmotorized, mechanized use	Two-wheel drive vehicles predominant, but also four-wheel drives and nonmotorized, mechanized use	Ordinary highway auto and truck traffic is characteristic	Wide variety of street vehicles and highway traffic is ever present

3.0 Detailed Descriptions of Off-Highway Vehicle (OHV) Designations Used in the Kemmerer Resource Management Plan (RMP)

The Kemmerer Resource Management Plan (RMP) includes off-highway vehicle (OHV) designations as follows:

- Area Open to All Motor Vehicle Travel
- Motor Vehicle Travel Limited to Existing Roads and Trails
- Motor Vehicle Travel Limited to Designated Roads and Trails
- Area Closed to All Motor Vehicle Travel
- Motor Vehicle Travel Closed During Certain Times of the Year

This appendix provides clear definitions of what each designation means so that the potential for misunderstanding is minimized. These designations apply on a sub-area basis, with the specific designations shown on the maps.

Designation: Open to All Motor Vehicle Travel

- OHVs may be operated off-road on the public lands as long as this activity neither causes nor is likely to cause significant, undue damage to or disturbance of the soil, wildlife, wildlife habitats, improvements, cultural, or vegetative resources or other authorized uses of the public lands.
- In open areas, motor vehicle travel is allowed off-road at all times.
- Activities such as hill climbing or organized OHV events may be allowed if the area is approved for such activities.

Designation: Motor Vehicle Travel Limited to Existing Roads and Trails

- This designation includes all roads and trails that were in existence and mapped when the RMP was approved.
- Portal signs will be placed on main travel routes entering the area from highways or other public roads.
- Maps or brochures showing OHV designations will be published.
- This designation is effective on the date the RMP is approved.

Designation: Motor Vehicle Travel Limited to Designated Roads and Trails

When this designation is implemented, motor vehicle travel will be allowed on all roads designated as open to such travel. All other roads in the area, if any, are closed to motor vehicles.

- Signs will be placed on main travel routes entering the area.
- Signs will be placed on individual “designated” roads in the area.
- Closed roads will be marked or will be obliterated and reclaimed.
- Maps and (or) brochures will be published to show the network of authorized roads and vehicle routes.
- Between the time of publication of the RMP and implementation of this designation, all motor vehicle travel would be limited to existing roads and trails.

Designation: Closed to All Motor Vehicle Use

Motor vehicle access is allowed only upon approval of the authorized officer.

- Motor vehicle travel may be allowed for firefighting and emergencies only.
- This designation applies to all resource uses.

Designation: A Seasonal Limitation on Motor Vehicle Access Has Been Established

Motor vehicle travel is not allowed for a portion of the year, usually to protect wintering wildlife on crucial winter ranges.

- The area is closed to all motor vehicles from (date to date); e.g., January 1 – April 30.
- Nonmotorized access/travel is authorized the entire calendar year.
- Seasonal closure to motor vehicle access is necessary to protect big game species on crucial winter range.
- Signs would be placed on all roads on public land entering the seasonal closure area.
- Maps or brochures showing the area would be published
- Seasonal closures are usually coordinated with other management agencies, such as the Wyoming Game and Fish Department (WGFD).

The above could "overlap" parts or all of other OHV decisions. It may be appropriate to close certain roads seasonally for a variety of resource-related reasons.

Exempted Activities

The seasonal closure affects public lands in the identified areas. Except for travel on highways or county roads, motorized vehicle travel within the areas will be allowed only by written authorization from the Kemmerer Field Manager. Personnel of the BLM, Wyoming Game and Fish Department, U.S. Department of Agriculture-APHIS and Forest Service, U.S. Fish & Wildlife Service, and law enforcement personnel are exempt from this closure only when performing official duties. Operators of existing oil and gas facilities may perform maintenance and pumping, as approved, current ROW holders may perform necessary maintenance, and livestock operators holding a current grazing permit may perform permitted activities.

OHV Access for Persons with Disabilities

Section 504 of the Rehabilitation Act (Public Law 93-112, as amended) requires federal land-managing agencies to provide reasonable opportunities for access for persons with disabilities. Accordingly, during hunting seasons, individuals possessing a valid WGFD "Permit for Hunters with Qualifying Disabilities" will be allowed to use an OHV to retrieve harvested big game and trophy game animals in LIMITED areas beyond the 300-foot travel zone without any additional authorization, providing resource damage or the creation of new roads do not occur.

In addition, field managers will consider requests by persons with disabilities for authorization for cross-country travel for the purposes of gaining access to the public lands for recreational purposes. These requests will be considered on a case-by-case basis. Decisions will be based on a combination of factors, including need, other available opportunities, resource management considerations, and the assurance that the activity can be carried out without causing resource damage. If OHV use authorizations are granted, the above criteria will be included in the written authorization.

Travel Management Planning

Travel management planning is an ongoing function at the field office level. It includes developing inventories that serve as the basis for travel and transportation decisions. It will address issues such as the need for additional access, additional roads or trails, or the need to upgrade or reroute existing roads, the need to close certain roads, or the need to update or change OHV or other travel and transportation-related designations. Travel and transportation decisions will be based on resource management and development needs, public involvement, and coordination with state and local governmental agencies and the public. Travel management planning includes motorized, nonmotorized, mechanized, equestrian, over-snow, and other modes of travel.

From time to time, roads are built on public lands for the purposes of facilitating resource development, such as oil and gas operations. These roads are authorized by the BLM under valid RMP decisions. In such cases, they are added to the authorized system of roads and incorporated into the existing OHV designations.

Glossary Definitions

Resource Damage: Defined as leaving signs of vehicle use, such as wheel ruts in wet meadows, visual scars on hillsides, or soil erosion. Additional examples include surface disturbance that causes the loss of vegetative cover, degradation of wildlife habitats, the creation of new roads, and the introduction of noxious weeds. Damage to vegetation also includes crushing or uprooting trees and shrubs. The determination of whether resource damage has occurred is left to the discretion of field managers and law enforcement personnel based on resource monitoring and recommendations from staff.

Dispersed Recreation: Recreational activities are considered "dispersed" when they do not depend on developed facilities, such as campgrounds, playgrounds, or developed park areas. User density is often low relative to developed or intensive recreation. Activities thought of as examples of dispersed recreation include, but are not limited to primitive camping, hunting, hiking, and off-highway driving. Dispersed recreation is usually noncommercial.

Dispersed Uses: Certain activities occur on BLM-administered lands that do not require specific authorizations and do not necessarily cause any appreciable disturbance or damage to the public lands. Dispersed camping, parking, picnicking, and recovering a harvested big game animal are examples. These are activities that can normally be accomplished within a minimal distance of roads and vehicle trails. The public is allowed to pursue these activities up to 300 feet away from roads and trails as long as such activities do not cause resource damage or create new roads or extend existing roads.

Existing Roads and Trails: Routes existing prior to the date the OHV designation is announced in the *Federal Register*. These routes may have been constructed and maintained, or may be two-track routes created and maintained, by the passage of motor vehicles and receive regular use.

Designated Routes: Designated routes are a network of roads and trails, specifically identified as the official travel and transportation network for a given area. Designated roads and trails are identified on maps, identified by signs in the field, and may be assigned road numbers for inventory and identification purposes. This may include routes on the official BLM transportation plan that are routinely maintained, as well as routes that were user-created and receive no regular maintenance.

Trails: The term "trails," when used in the phrase "roads and trails" in association with OHV designations means motor vehicle trails only. These include distinct two-track vehicle trails or single-track motorcycle trails created by the passage of motor vehicles and which receive continuous use. Cow paths, foot trails, mountain bike trails, and game trails are not motor vehicle trails; therefore, motor vehicle travel is not allowed on them. Vehicle traces created by the unauthorized passage of a few motor vehicles are not legal motor vehicle trails.

Mechanical Transport: Nonmotorized vehicles, devices, or contrivances for moving people or material over land, water, snow, or air that have moving parts are considered mechanical transport. This includes, but is not limited to, sailboats, sailboards, hang gliders, parachutes, bicycles, game carriers, hand carts, wheel barrows, and wagons. The term does not include wheelchairs, nor does it include horses or other pack stock, skis, snowshoes, nonmotorized river craft including, but not limited to, drift boats, rafts, and canoes, or sleds, travois, or similar devices without moving parts. The terms “mechanical transport” and “motor vehicle” are not synonymous.

Off-Road Travel: The term “off-road travel” means travel off of existing roads and trails or driving cross-country.

Closed Areas: Areas under the “closed” designation are closed to all motor vehicle use. Motor vehicle access is allowed only for emergencies or by special authorization from the authorized officer.

Recreation Opportunity Spectrum (ROS): The Recreation Opportunity Spectrum (ROS) provides a framework for stratifying and defining classes of outdoor recreation opportunity environments. Possible mixes of activities, settings, and experience opportunities have been arranged along a spectrum known as the ROS. Each of several classes, ranging from primitive to urban, is defined in terms of its combination of activity, setting, and experience opportunities. ROS classes become an integral part of management prescriptions for recreation in the RMP.

Necessary Tasks: Necessary tasks are actions that support commercial or industrial uses of public lands and need to be accomplished by a person or organization seeking or holding an authorization from the BLM. These include tasks that are sometimes accomplished without formal written approval or in advance of receiving an authorization.

KEMMERER
PROPOSED RESOURCE MANAGEMENT PLAN AND
FINAL ENVIRONMENTAL IMPACT STATEMENT

Appendix J

Technical Support Document for Air Quality

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Appendix J
Technical Support Document for Air Quality

This technical support document describes the process used to conduct air quality impact analysis for the Kemmerer Resource Management Plan (RMP) revision, Draft Environmental Impact Statement (EIS). This document will serve as the basis for subsequent air quality impact analyses of other alternatives and the Proposed RMP. Appendix J is divided into the following six sections:

1.0 Regulatory Framework
2.0 Agency Roles and Authorities
3.0 Existing Air Quality
4.0 Air Quality Impact Analysis
5.0 Emission Calculations
6.0 References

Copies of this technical support document and accompanying data files are available upon request from the Bureau of Land Management (BLM) Kemmerer Field Office.

1.0 REGULATORY FRAMEWORK

The basic framework for controlling air pollutants in the United States is mandated by the 1970 Clean Air Act (CAA) and its amendments, EPA regulations, and state and local air quality regulations. The CAA addresses criteria air pollutants, state and national ambient air quality standards for criteria air pollutants, and the Prevention of Significant Deterioration program. EPA regulations address ambient air quality standards, emission control technology, modeling and monitoring, and AQRV impacts including regional haze. State and local agencies can impose more stringent regulations than federal standards.

Ambient Air Quality Constituents

Ambient air quality constituents include concentration, visibility, and atmospheric deposition. Air pollutants addressed in this study include criteria pollutants, hazardous air pollutants (HAP), and sulfur and nitrogen compounds.

Criteria Pollutants

Criteria pollutants are those for which national standards of concentration have been established. Ambient concentrations of these pollutants greater than the standards represent a risk to human health. Criteria pollutants include carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), ozone (O_3), particulate matter (PM_{10}, $PM_{2.5}$), and lead, each of which is listed below.

Carbon Monoxide. CO is an odorless, colorless gas formed during any combustion process, such as operation of engines, fireplaces, and furnaces. High concentrations of CO affect the oxygen-carrying capacity of the blood and can lead to unconsciousness and asphyxiation. Wildfires are natural sources of CO.

Nitrogen Dioxide. NO_2 is a highly reactive compound formed at high temperatures during operation of fossil fuel combustion. At high concentrations, it can form a red-brown gas. At concentrations in excess of the EPA air quality standard, it is a respiratory irritant; however, all areas of the United States are in compliance with this air quality standard. During fossil fuel combustion NO is released into the air that reacts in the atmosphere to form NO_2. NO plus NO_2 is a mixture of nitrogen gases, collectively called nitrogen oxides (NO_x). NO_x emissions can convert to ammonium nitrate particles and nitric acid, which can cause visibility impairment and atmospheric deposition. Bacterial action in soil can be a natural source of nitrogen compounds.

Sulfur Dioxide. SO_2 forms during combustion from trace levels of sulfur compounds in fuels (i.e, coal, sour gas or diesel fuel). At concentrations in excess of national air quality standards, it is a severe respiratory irritant. SO_2 can convert to ammonium sulfate ($(NH_4)2SO_4$) and sulfuric acid (H_2SO_4), which can cause visibility impairment and acid rain. Volcanoes are natural sources of SO_2. Anthropogenic sources include refineries and power plants.

Ozone. O3 is a faint blue gas that is generally not emitted directly into the atmosphere but is formed in the atmosphere from complex photochemical reactions involving NO2 and volatile reactive organic compounds (VOC). Internal combustion engines are one source of NOx. However, typically coal fired power plants have the highest NOx emissions although any combustion source will produce NOx. Sources of VOCs include, but are not limited to, automotive emissions, paint, varnish, oil and gas operations and some types of vegetation. The faint acrid smell common after thunderstorms is caused by ozone formation by lightning. O3 is a strong oxidizing chemical that can burn lungs and eyes, and damage plants. Ozone is a severe respiratory irritant at concentrations in excess of the federal standards. EPA is currently in the process of revising the ozone standard as part of its statutory requirements under the CAA.

Particulate Matter. Particulate matter (e.g., soil particles, hair, pollen) are essentially small particles suspended in the air that settle to the ground slowly and may be re-suspended if disturbed. Separate allowable concentration levels for particulate matter are based on the relative size of the particle:

- PM_{10} particles, particles with diameters of less than 10 micrometers, are small enough to be inhaled and can cause adverse health impacts at concentrations in excess of the standard.
- $PM_{2.5}$ particles, particles with diameters of less than 2.5 micrometers, are so small that they can be drawn deeply into the lungs and cause serious health problems at concentrations in excess of the standard. Particles of this size also are the main cause of visibility impairment.

Lead. Before the widespread use of unleaded fuel in automobiles, lead particles were emitted from automobile tailpipes. Lead is not considered in this RMP/EIS because no proposed projects are expected to emit lead. The lead standard also will not be addressed in this appendix because lead is not a current concern; it will, however, be considered in future projects, as applicable.

Hazardous Air Pollutants

Although HAPs, including N-hexane, ethylbenzene, toluene, xylene, formaldehyde, and benzene, do not have ambient air quality standards, the U.S. Environmental Protection Agency (EPA) has issued reference concentrations for evaluating the inhalation risk for cancerous and noncancerous health impacts, known as reference concentrations for chronic inhalation.

The EIS associated with the Kemmerer RMP is a National Environmental Policy Act (NEPA) document and not a regulatory document, but the Record of Decision is binding and a "public record" (see 40 Code of Regulations [CFR] 1505.2). In addition, there are regulatory issues that should be taken into account in preparing this EIS and ensuing project-specific EISs. Regulation of HAPs is achieved through compliance with the applicable maximum achievable control technology (MACT) standards and not through ambient air quality standards. Regulatory agencies implement control through Section 112 programs, specifically Section 112(g) case-by-case MACT determinations based on 40 CFR Part 63, Subpart B, and Section 112(d) MACT emission standards.

Any source that emits or has the potential to emit 10 tons per year or more of any HAP or 25 tons per year or more of any combination of HAPs is considered a major source and will require a Title V, Part 70, operating permit review and permit. This may include either a case-by-case 112(g) MACT determination, if the source is new or has had major modifications and no applicable MACT emission standard has been promulgated, or compliance with an applicable MACT emission standard. Specific regulations that may apply in the planning area include 40 CFR Part 63 Subpart HH, National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities; 40 CFR Part 63 Subpart HHH, National Emission Standards for Hazardous Air Pollutants From Natural Gas Transmission and Storage Facilities; and 40 CFR Part 63 Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. This last regulation, new in 2004, affects source categories using reciprocating engines for gas compression.

HAP emissions are associated with industrial activities, such as oil and gas operations, refineries, paint shops, dry cleaning facilities, and woodworking shops. Because this analysis is qualitative, no specific analyses of either short- or long-term HAP impacts are included.

Atmospheric Deposition Constituents

Sulfur and nitrogen compounds that can be deposited in terrestrial and aquatic ecosystems include nitric acid, nitrate, ammonium, and sulfate. Nitric acid and nitrate are not emitted directly into the air, but form in the atmosphere from industrial and automotive emissions of NO_x. Sulfate is formed in the atmosphere from industrial emission of sulfur dioxide (SO_2). Deposition of nitric acid, nitrate, and sulfate can adversely impact plant growth, soil chemistry, lichens, aquatic environments, and petroglyphs. Ammonium is primarily associated with feedlots and agricultural fertilization. Ammonium deposits can affect terrestrial and aquatic vegetation. Although deposition may be beneficial as a fertilizer, it can adversely impact the timing of plant growth and dormancy.

Although this analysis will be qualitative, future specific projects will require quantitative analyses using the criteria listed below.

Wyoming and National Ambient Air Quality Standards

Wyoming Ambient Air Quality Standards (WAAQS) and National Ambient Air Quality Standards (NAAQS) are health-based standards for the maximum concentration of air pollutants at all locations to which the public has access. The WAAQS and NAAQS are legally enforceable standards. Concentrations above the WAAQS and NAAQS represent a risk to human health. State standards must be as strict as, or stricter than, federal standards.

The EPA has developed standards for each pollutant for a specific averaging time (see Table J-1). Short averaging times (1, 3, and 24 hours) address short-term exposure, while the annual standards address long-term exposure. Longer-term standards are set to lower allowable concentrations than are short-term standards to recognize the cumulative impacts of long-term exposure.

Prevention of Significant Deterioration

The goal of the Prevention of Significant Deterioration (PSD) program is to ensure that air quality in areas with clean air does not significantly deteriorate, while a margin for future industrial growth is maintained. Under the PSD program, each area in the United States is classified by the air quality in that region according to the following system:

- **PSD Class I Areas.** Congressional mandated PSD Class I areas with pristine air quality, such as wilderness areas, national parks, and some Indian reservations, are accorded the strictest protection. Only very small incremental increases in pollutant concentrations are allowed in order to maintain the very clean air quality in these areas.

- **PSD Class II Areas.** Essentially, all areas that are not designated as Class I are designated as Class II. Moderate incremental increases in pollutant concentrations are allowed, although the concentrations are not allowed to reach the concentrations set by Wyoming and federal standards (WAAQS and NAAQS).
- **PSD Class III Areas.** No areas have been designated yet as Class III. A larger incremental increase in pollutant concentrations would be allowed, up to the WAAQS and NAAQS.

The PSD program requires that pollutant concentrations in pristine Class I areas are lower than required to protect public health.

Table J-1. National and Wyoming Ambient Air Quality Standards

Pollutant	Average Time	NAAQS (µg/m^3)	WAAQS (µg/m^3)
Carbon Monoxide (CO)	1 hour	40,000	40,000
	8 hours	10,000	10,000
Nitrogen Dioxide (NO_2)	Annual[1]	100	100
Ozone (O_3)	–	–	–
	8 hours	147	–
Particulate Matter (PM_{10})	24 hours	150	150
	Annual	-	50
Particulate Matter ($PM_{2.5}$)	24 hours	35	65
	Annual	15	15
Sulfur Dioxide (SO_2)	3 hours	1,300[2]	1,300
	24 hours	365	260
	Annual	80	60
Hydrogen Sulfide (H_2S)	½ hour[3]	–	70
	½ hour[4]	–	40

Sources: Wyoming DEQ 2006; EPA 2006a, 2008

[1] The standard of 100 µg/m^3 NO_2 is equivalent to a standard of 0.05 ppm (Wyoming DEQ 2006).

[2] Secondary standard only, as there is no 3-hour federal primary standard for SO_2.

[3] Average not to be exceeded more than two times per year.

[4] Average not to be exceeded more than two times in any 5 consecutive days.

µg/m^3	micrograms per cubic meter
NAAQS	National Ambient Air Quality Standards
WAAQS	Wyoming Ambient Air Quality Standards

Table J-2 provides the incremental increases allowed for specific pollutants in Class I and Class II areas.

In project specific NEPA analyses comparisons of potential PM_{10}, NO_2, and SO_2 concentrations with PSD increments are intended to evaluate a threshold of concern only and do not represent a regulatory PSD increment consumption analysis. Regulatory PSD increment consumption analyses are solely the responsibility of the State of Wyoming, which has been granted primacy (with EPA oversight) under the CAA.

In project-specific EISs, the BLM does not expect that a PSD analysis will be performed; rather, the PSD standards are used as a reference only to give the public a better understanding of the level of potential impact.

Table J-2. Prevention of Significant Deterioration Increments

Pollutant	Average Period	PSD Increment (μg/m^3) Class I	PSD Increment (μg/m^3) Class II
Sulfur Dioxide (SO_2)	3-hours[1] 24-hours[1] Annual	25 5 2	512 91 20
Particulate Matter (PM_{10})	24-hours Annual	8 4	30 17
Nitrogen Dioxide (NO_2)	Annual	2.5	25
Carbon Monoxide (CO)	1-hour 8-hours	None None	None None
Lead	3-months	None	None

Source: Wyoming DEQ 2006

[1] The maximum allowable increment may be exceeded once per year at any receptor site (Wyoming DEQ, 2004).

PSD Prevention of Significant Deterioration

Regional Haze Regulations

Visibility impairment in the form of regional haze obscures the clarity, color, texture, and form of what we see. Haze-causing pollutants (mostly fine particles) are directly emitted into the atmosphere or are formed when gases emitted into the air form particles as they are carried downwind. Emissions from human-caused and natural sources can be carried great distances, contributing to regional haze. The Wyoming Department of Environmental Quality–Air Quality Division (DEQ AQD) submitted its Regional Haze State Implementation Plan (SIP) in accordance with 40 CFR, Part 51.309, in December 2003. The EPA has not taken action yet on this SIP.

Visual range, one of several ways to express visibility, is the farthest distance at which a person can distinguish a dark landscape feature from a light background, such as the sky. Depending on the scene and the meteorological conditions, without human-caused visibility impairment, natural visual range is estimated to average about 110 to 115 miles in the western United States and 60 to 80 miles in the eastern United States (Malm 1999).

The EPA developed regional haze regulations in response to the CAA amendments of 1977 and 1990. These regulations are intended to maintain visibility on the least-impaired days and to improve visibility on the most-impaired days in mandatory federal Class I areas across the United States, so that visibility in these areas is returned to natural conditions by the year 2064. These regulations require states to submit a regional haze SIP and progress reports to demonstrate reasonable progress toward the 2064 goal of achieving natural conditions within mandatory Federal PSD Class I Areas.

Applicability to the Kemmerer Planning Area

Air pollution impacts are limited by local, state, tribal, and federal air quality regulations, standards, and implementation plans established under the CAA and administered by the Wyoming DEQ AQD with oversight from the EPA. Air quality regulations require that proposed new, or modified existing, air pollutant emission stationary sources (including oil and gas compression facilities) undergo a permitting review before their construction can begin. Therefore, the Wyoming DEQ AQD has the primary authority and responsibility to review permit applications and to require emission permits, fees, and control devices before construction or start of operation.

Fugitive dust and exhaust from construction activities, along with air pollutants emitted during operation (for example, well operations, booster [field] and pipeline [sales] compressor engines associated with natural gas wells), are potential causes of air quality impacts. These issues are more likely to generate public concern where natural gas development activities occur near residential areas or near sensitive Class I and Class II areas.

The U.S. Forest Service (USFS), the National Park Service (NPS), and the U.S. Fish and Wildlife Service (USFWS), located throughout Wyoming, also have expressed concerns about potential atmospheric deposition (acid rain) and visibility impacts within downwind PSD Class I and PSD Class II sensitive areas under their administrations.

The NAAQS and the WAAQS are health-based standards for the maximum acceptable concentrations of air pollutants at locations to which the public has access. The analysis of the proposed alternatives must demonstrate continued compliance with all applicable local, state, tribal, and federal air quality standards. Existing air quality throughout the project area is in attainment of all ambient air quality standards, as demonstrated by the relatively low concentration levels presented in Tables J-3 and J-4.

Air quality regulations require that stationary proposed new or modified existing air pollutant emission sources (including oil and gas compression facilities) undergo a permitting review before their construction can begin. Therefore, the Wyoming DEQ AQD has been given primary authority over and responsibility for reviewing permit applications and for requiring emission permits, fees, and control device before construction and (or) operation. In addition, the U.S. Congress (through CAA Section 116) authorized local, state, and tribal air quality regulatory agencies to establish air pollution control requirements more (but not less) stringent than federal requirements. Also, under both the Federal Land Policy and Management Act and the CAA, the BLM cannot authorize any activity that would not conform to all applicable local, state, tribal, and federal air quality laws, regulations, standards, and implementation plans.

Given the project area's current attainment status, future development projects that have the potential to emit more than 250 tons per year of any criteria pollutant (or certain listed sources that have the potential to emit more than 100 tons per year) would be required to undergo a site-specific regulatory PSD increment consumption analysis under the federal New Source Review permitting regulations. Development projects that require PSD permits also may be required by the applicable air quality regulatory agencies to incorporate additional emission control measures (including a best available control technology [BACT] analysis and determination) to ensure protection of air quality resources and to demonstrate that the combined impacts of all PSD sources will not exceed the allowable incremental air quality impacts for NO_2, PM_{10}, and SO_2. Minor sources having emissions below the cutoff rates mentioned above do not require PSD permits; nevertheless, their emissions consume increment. Sources below the PSD permit application threshold are still required to apply for a Wyoming minor operating and construction permit ,which requires a BACT analysis.

A regulatory PSD increment consumption analysis may be conducted, either as part of a New Source Review or independently. The determination of PSD increment consumption is a legal responsibility of the applicable air quality regulatory agencies, with EPA oversight. In addition, an analysis of cumulative impacts due to all existing sources and the permit applicant's sources is required during a New Source Review to demonstrate that applicable ambient air quality standards will be met during the operational lifetime of the permit applicant's operations.

Table J-3. Background Concentrations and Applicable Ambient Air Quality Standards

Pollutant/	Averaging Time/	Concentration (μg/m^3)	NAAQS (μg/m^3)	WAAQS (μg/m^3)	Location/Sampling Dates
Nitrogen Dioxide	Annual	3.4	100	100	Green River Basin Visibility Study, Green River, WY (2001)
Ozone	8 Hours	147	157	157	Green River Basin Visibility Study, Green River, WY (2001)
PM_{10}	24 Hours Annual	48 25	150 50	150 50	Moxa Arch Infill Project, Rock Springs, WY (2005)
Carbon monoxide	1 Hour 8 Hours	2229 1148	40,000 10,000	40,000 10,000	Colorado Oil Shale Projects, Rifle and Mack, CO (early 1980's)
Sulfur dioxide	3 Hours 24 Hours Annual	29 18 5	1,300 365 80	1,300 260 60	Craig Power Plant and oil shale areas (1980-1984)

Source: Wyoming DEQ AQD 2006

μg/m^3	micrograms per cubic meter
NAAQS	National Ambient Air Quality Standards
PM_{10}	particulate matter less than 10 microns in diameter
ppm	parts per million
WAAQS	Wyoming Ambient Air Quality Standards

Table J-4. Ambient Concentrations Measured near Specific Sources

Pollutant/Monitoring Station (Monitor ID)	Average Time/ Measurement	Concentration (μg/m^3) (Annual Average or 24-Hour Maximum)			NAAQS (μg/m^3 for PM_{10})
		2003	2004	2005	
PM_{10} (μg/m^3)					
FMC Skull Point Mine, Kemmerer, Lincoln County (560230800)[1]	Annual 24 Hours	33 189	16 44	23 221	50 150
Pittsburg and Midway Coal #1, Kemmerer, Lincoln County (560230814)	Annual 24 Hours	7 22	5 18	7 16	50 150
Pittsburg and Midway Coal #2, Kemmerer, Lincoln County (560230815)	Annual 24 Hours	8 30	8 21	9 23	50 150
Pacificorp Naughton Plant, Kemmerer, Lincoln County (560230820)	Annual 24 Hours	18 104	18 110	13 60	50 150
FMC Trona Site 002, Sweetwater County (560371002)	Annual 24 Hours	12 39	11 34	13 32	50 150
FMC Trona Site 866, Sweetwater County (560371002)	Annual 24 Hours	19 54	18 63	19 101	50 150
General Chemical Site 1, Sweetwater County (560370013)	Annual 24 Hours	20 68	20 72	18 57	50 150
General Chemical Site 3, Sweetwater County (560370013)	Annual 24 Hours	12 33	11 29	11 26	50 150
General Chemical Site 4, Sweetwater County (560370013)	Annual 24 Hours	16 48	14 55	15 38	50 150

Source: EPA 2006a

[1] Although this mine is now held by Pittsburg and Midway Coal Company and is no longer called Skull Point Mine, this is still the name of the monitoring station used in EPA (2006a).

μg/m^3	micrograms per cubic meter
ID	Identification
N/A	not applicable
NAAQS	National Ambient Air Quality Standards
PM_{10}	particulate matter less than 10 microns in diameter
ppm	parts per million

Sources subject to the PSD permit review procedure also are required to demonstrate potential impacts on air quality-related values (AQRV). These include visibility impacts, degradation of mountain lakes due to atmospheric deposition (acid rain), and impacts on sensitive flora and fauna in Class I areas. The CAA also provides specific visibility protection procedures for the mandatory federal Class I areas designated by the U.S. Congress on August 7, 1977, which included wilderness areas greater than 5,000 acres in size, as well as national parks and national memorial parks greater than 6,000 acres in size as of that date.

2.0 AGENCY ROLES AND AUTHORITIES

U.S. Environmental Protection Agency

The EPA administers the federal CAA (42 U.S. Code [U.S.C.] 7401 et seq.) to maintain the NAAQS that protect human health and to preserve the rural air quality in the region by ensuring the PSD Class I and Class II increments for SO_2, NO_2, and PM_{10} are not exceeded. The EPA has delegated this CAA authority to the State of Wyoming.

Wyoming Department of Environmental Quality

Wyoming regulates pollutants emitted into the air through the Wyoming Environmental Quality Act (W.S. 35-11-101 et seq.). Wyoming also is authorized by an approved SIP to administer all requirements of the PSD permit program under the CAA. In addition, the approved Wyoming SIP contains a number of programs that provide for the implementation, maintenance, and enforcement of the NAAQS, including a New Source Review program for minor source permitting that requires, among other things, an application of BACT for all new or modified sources, regardless of size or source category. Included, as well, are authorities for the control of particulate emissions, such as including fugitive particulate emissions from haul roads, access roads, or general facility boundaries. Wyoming also has been delegated the responsibility for operating an approved ambient air quality monitoring network for the purpose of demonstrating compliance with the NAAQS and the WAAQS.

Bureau of Land Management

NEPA requires that federal agencies consider mitigation of direct, indirect, and cumulative impacts during their preparation of an EIS (BLM Land Use Planning Manual 1601). Under the CAA, federal agencies must comply with SIPs regarding the control and abatement of air pollution. Before approval of RMPs or amendments to RMPs, the state director is to submit any known inconsistencies with SIPs to the governor of that state. If the governor of the state recommends changes in the proposed RMP or amendment to meet SIP requirements, the state director shall give the public an opportunity to comment on those recommendations (BLM Land Use Planning Manual, Section 1610.3-2).

U.S. Forest Service

The USFS administers national forests, which include several wilderness areas that could be affected by direct impacts associated with the project, such as the Bridger and Fitzpatrick wilderness areas which have mandatory federal Class I designations. As federal land mangers, the USFS could act as a consultant to recommend that the BLM impact analysis results, or any future EPA- or state-administered PSD refined impact analysis results (if justified), trigger adverse impairment status. If the USFS determines impairment of wilderness areas, the BLM, the state, and/or the EPA might need to mitigate this predicted adverse air quality impact.

National Park Service

Two areas administered by the NPS with a mandatory federal Class I area designation, Grand Teton and Yellowstone National Parks, could be affected by direct impacts associated with emissions within the planning area. As federal land managers, the NPS could act as a consultant to recommend that the BLM impact analysis results, or any future EPA- or state-administered PSD refined impact analysis results (if justified), trigger adverse impairment status. If the NPS determines impairment of NPS-administered Class I areas, the BLM, the state, and/or EPA might need to mitigate this predicted adverse air quality impact.

3.0 EXISTING AIR QUALITY

As described in Chapter 3, Affected Environment (Air Quality section), specific air quality monitoring is not conducted throughout most of the project area, but air quality conditions are considered to be generally good, as characterized by limited air pollution emission sources (few industrial facilities and residential emissions in the relatively small communities and isolated ranches) and good atmospheric dispersion conditions, resulting in relatively low air pollutant concentrations. Table J-3 summarizes the ambient air quality background concentrations in the planning area. This information was provided by the Wyoming DEQ. Although monitoring is conducted primarily in urban or industrial areas, the data selected are considered to be the best available representation of background air pollutant concentrations throughout the project area. The assumed background pollutant concentrations are below applicable ambient air quality standard for all pollutants and averaging times (although ozone levels approach the standards). Federal standards, Wyoming standards, and PSD increment values are presented in Tables J-1 and J-2.

4.0 AIR QUALITY IMPACT ANALYSIS

As described in Chapter 4, Environmental Consequences (Air Quality section), a qualitative emission comparison approach was used for this assessment. A qualitative method was selected because of a lack of specific project information on location, types, and magnitude of potential projects.

Emissions calculations were based on the best available engineering data and assumptions, emission inventory procedures, and professional and scientific judgment. However, where specific data or procedures were not available, activity assumptions were incorporated, as documented in the emission spreadsheets.

For any future projects, significance criteria for potential air quality impacts will include local, state, tribal, and federally enforced legal requirements to ensure that air pollutant concentrations remain within specific allowable levels. Table J-1 presents these requirements and legal limits.

Because the potential air pollutant emission sources comprise many small sources spread out over a very large area, discrete visible plumes are not likely to impact the distant sensitive areas, but the potential for cumulative visibility impacts (increased regional haze) is a concern. Regional haze degradation is caused by fine particles' and gases' scattering and absorbing light. Potential changes to regional haze are calculated in terms of a perceptible "just noticeable change" (1.0 deciview) in visibility when compared to background conditions in mandatory federal PSD Class I areas.

It is important to note that before actual development could occur, the applicable air quality regulatory agencies (including the state, tribe, or the EPA) would need to review specific air pollutant emissions preconstruction permit applications that examine potential project-specific air quality impacts. As part of these permit reviews (depending on source size), the air quality regulatory agencies could require additional air quality impact analyses or mitigation measures. Thus, before development occurred, additional site-specific quantitative air quality analyses would be performed to identify potential impacts and to ensure protection of air quality. In addition, federal land managers would require a demonstration that potential effects from proposed projects would not adversely impact AQRV's (visibility and deposition) in sensitive Class I and Class II areas.

5.0 EMISSION CALCULATIONS

When reviewing the emission inventory, it is important to understand that assumptions were made regarding development. For example, there is uncertainty regarding ultimate development of energy resources (e.g., number of wells, equipment used, specific locations of wells, etc.). In general, the assumptions that were made would tend to result in a conservatively high estimate of emissions. For instance, given the number of sources included in this analysis, the likelihood that all emission sources would actually operate at their reasonable, foreseeable maximum emission rates over an entire year (or even 24 hours) is small.

Summary emission inventories for each of the BLM activities for all of the alternatives are found in Chapter 4, Air Quality section. Activity data used to estimate emissions for proposed emission sources were obtained from Kemmerer Field Office staff and NEPA analyses performed for BLM actions within Wyoming that are similar to those associated with the actions proposed in this RMP/EIS (BLM 2002; BLM 2005). Emission factors used to estimate proposed emissions were obtained from (1) the EPA NONROAD Emissions Model (EPA 2004), (2) Wyoming DEQ AQD BACT levels for natural gas-fired internal combustion engines (Hanify 2006; Wyoming DEQ 2000), (3) MOBILE6 emissions models for on-road vehicles (EPA 2003), and (4) EPA AP-42 emission factors for various activities (EPA 2006b).

The analysis includes emissions estimates for the following activities: (1) oil development, (2) coalbed natural gas and conventional natural gas development, (3) coal mine development, (4) salable and locatable minerals development, (5) renewable energy development, (6) livestock management activities, (7) vegetation management, (8) fire management (including prescribed fire), (9) forest and woodlands activities, (10) rights-of-way, (11) OHV use, (12) resource roads, (13) trona mining and processing, and (14) geophysical exploration. Activities related to cultural resources, paleontology, recreation, noxious and invasive weed control, and wildlife and fish would produce inconsequential amounts of air emissions.

Assumptions Used in Developing Emissions for the Kemmerer RMP

The following assumptions were used in the emission calculations:

- All emission sources operated at their reasonably foreseeable maximum emission rates (as identified in the other resource sections of this document) simultaneously throughout the area.
- All producing coalbed natural gas (CBNG) and conventional oil and gas wells projected in the RFD and currently producing were assumed to be fully operational and to remain operating, except for normal projected well closures throughout the area (well numbers are from BLM 2006a).
- For oil, gas, and CBNG wells, development of new federal producing wells was assumed to occur at a uniform rate from 2004 through 2020.
- Induced or secondary growth (e.g., increases in vehicle miles traveled) is not included in the emissions inventory. In addition, emissions from burning fossil fuels produced from BLM mineral estate are not included (unless the emissions are from a facility sited on BLM surface land or are directly attributable to activities on BLM surface). Only activities directly related to BLM actions are considered.
- Emissions from skid-mounted or portable asphalt hot mix plants that are occasionally sited on BLM land at sand and gravel pits are not included. These plants are temporary (typically seasonal).

- Stationary sources associated with oil and gas development would operate at emission levels based on currently observed BACT levels, and compressor stations for natural gas and CBNG would be equipped with nonselective catalytic reduction (NSCR) catalyst.
- Activity data associated with management actions other than those related to oil and gas wells (including CBNG wells) were averaged over the entire analysis period to produce annual average emissions, except for renewable energy development, where one development activity was assumed to occur in one year (2011) for modeling purposes and, for Alternatives C and D (which have 2 and 1.5 development activities, respectively), any remaining development activity was assumed to occur in 2020.
- EPA off-road emission standards were used to estimate emissions for non-road sources in project years 2006, 2011, and 2020. This approach simulates the replacement of existing sources by new lower-emitting equipment with future EPA off-road emission standards.
- Use of water application as a Best Management Practice (BMP) would reduce fugitive dust emissions from ground-disturbing activities during construction and reclamation activities and maintenance of roads at project sites by 50 percent from uncontrolled levels.
- BMPs for surface-disturbing activities are applied under all alternatives. BMPs provide protection to soil resources and minimize adverse impacts to soil stability, compaction, and productivity.

Also, it should be noted that the estimates of emissions often employ resource-specific assumptions about equipment use (e.g., horsepower, load factor, operating hours per day, and number of days per activity) that are based on the best professional judgment of BLM staff. BLM has taken all possible steps to ensure the assumptions are reasonable; however, the estimates of current and future emissions are just that – estimates.

Detailed descriptions for emissions estimation for each activity follow. Individual tables of air emissions for all BLM activities were calculated in spreadsheets for each activity. These spreadsheets are available on CD.

Oil and Gas Wells Emissions Estimation

Criteria pollutant emissions from oil, coalbed natural gas, and conventional natural gas wells development were calculated based on data provided by the Kemmerer Field Office and used best available information, BACT, AP-42, and the emission studies from other BLM documents. Estimated emissions from coalbed natural gas and conventional natural gas wells include the following:

- Fugitive dust and combustive emissions from well pad construction activities
- Fugitive dust and combustive emissions from road traffic
- Combustive emissions from natural gas-fired compressors
- Fugitive VOC emissions from well-site pneumatic pumps
- Fugitive dust and combustive emissions from separators, dehydrators, and water-tank heater operations
- Fugitive dust and combustive emissions from compressor station visits
- Fugitive dust and combustive emissions from well workover operations
- Fugitive dust and combustive emissions from well and pipeline visits for inspection and repair
- VOC emissions from tank condensate and truck loadout (for natural gas wells only)
- Fugitive dust and combustive emissions from road-maintenance activities
- Fugitive dust and combustive emissions from road and well reclamation activities.

Estimated emissions from oil wells include the following:

- Fugitive dust and combustive emissions from well pad construction activities
- Fugitive dust and combustive emissions from road traffic
- Fugitive dust and combustive emissions from well workover operations
- Fugitive dust and combustive emissions from well and pipeline visits for inspection and repair
- Fugitive dust and combustive emissions from road maintenance activities.

The estimated numbers of oil and gas wells are provided by the Kemmerer Field Office and shown in Table J-5 (this table accounts for net wells in operation and subtracts wells that have been abandoned).

Table J-5. Producing Oil and Gas Wells in the Planning Area

Well Type	Existing Wells 2001	2011 Operational Wells	2020 Operational Wells
Alternative A			
Coalbed Natural Gas	0	97	189
Natural Gas	572	850	1,104
Oil	18	26	34
Alternative B			
Coalbed Natural Gas	0	42	79
Natural Gas	572	686	788
Oil	18	21	25
Alternative C			
Coalbed Natural Gas	0	94	184
Natural Gas	572	852	1,108
Oil	18	26	34
Alternative D (Proposed RMP)			
Coalbed Natural Gas	0	94	183
Natural Gas	572	848	1,101
Oil	18	26	34

Source: BLM 2008. Includes only those wells on federal land or mineral estate. Figures in this table differ from those in Table M-2 for two reasons: (a) existing wells in this table are for year 2001, whereas in Table M-2, existing wells are for year 2000; (b) rounding creates minor differences (one to two wells over the 20-year planning period).

Coal Mine Emission Estimation

Criteria pollutant emissions from coal mine operations were based on actual emissions for 2001 from Kemmerer Mine operations (Potter 2006), projected for the years 2011 and 2020 based on estimated future production (BLM 2006). Note that emissions from the proposed surface coal mine in the Haystack area, which could be leased under Alternatives A, C and D, are not included in the estimate because there is not enough information at this time to reliably forecast production quantity, or when the coal mine might become active.

Trona Mining and Processing Emission Estimation

Criteria pollutant emissions from trona mining and processing operations were based on actual 2001 emissions from operations at the four trona mines and processing plants in the planning area (two operated by FMC Corporation, and one each by General Chemical and Solvay Minerals) (Bott 2006). Emissions for the years 2011 and 2020 were estimated to be the same as current emissions, based on projected production being essentially constant for the foreseeable future (CREG 2006; BLM 2006).

Salable and Locatable Minerals Emission Estimation

Criteria pollutant emissions from salable and locatable minerals operations were calculated based on data provided by the Kemmerer Field Office and used best available information, BACT, AP-42, and emission studies from other BLM documents. Estimated emissions include the following:

- Fugitive dust emissions from sand and gravel or mineral processing
- Emissions from truck traffic on unpaved roads at the sand and gravel or mineral processing plant
- Emissions from batch-drop operations
- Fugitive dust and combustive emissions from development and reclamation activities.

Renewable Energy Emissions Estimation

Criteria pollutant emissions from renewable energy activities were calculated based on data provided by the Kemmerer Field Office and used best available information, BACT, AP-42, and the emission studies from other BLM documents. Estimated emissions include the following:

- Fugitive dust and combustive emissions from wind-energy development
- Fugitive dust emissions from commuting vehicles on unpaved roads
- Combustive emissions from commuting vehicles on unpaved and paved roads.

Livestock Grazing Emissions Estimation

Criteria pollutant emissions from livestock grazing operations were calculated based on data provided by the Kemmerer Field Office and used best available information, BACT, AP-42, and the emission studies from other BLM documents. Estimated emissions include the following:

- Fugitive dust and combustive emissions from construction of springs, reservoirs and pits, wells, pipelines, fences, and reservoir maintenance
- Fugitive dust emissions from commuting vehicles on unpaved roads
- Combustive emissions from commuting vehicles on unpaved and paved roads.

Vegetation Emissions Estimation

Criteria pollutant emissions from vegetation operations were calculated based on data provided by the Kemmerer Field Office and used best available information, BACT, AP-42, and the emission studies from other BLM documents. Estimated emissions include the following:

- Fugitive dust and combustive emissions from vegetative mechanical treatments (excluding hand work)
- Fugitive dust emissions from commuting vehicles on unpaved roads
- Combustive emissions from commuting vehicles on unpaved and paved roads.

Fire-Management Emissions Estimation

Criteria pollutant emissions from fire-management activities were calculated based on data provided by the Kemmerer Field Office and used best available information, BACT, AP-42, and the emission studies from other BLM documents. Estimated emissions include the following:

- Fugitive dust and combustive emissions from mechanical treatments (hand work) and prescribed fire
- Fugitive dust emissions from commuting vehicles on unpaved roads
- Combustive emissions from commuting vehicles on unpaved and paved roads.

Forest and Woodlands Emissions Estimation

Criteria pollutant emissions from forest and woodlands activities were calculated based on data provided by the Kemmerer Field Office and used best available information, BACT, AP-42, and the emission studies from other BLM documents. Estimated emissions include the following:

- Fugitive dust and combustive emissions from silviculture treatments
- Fugitive dust emissions from commuting vehicles on unpaved roads
- Combustive emissions from commuting vehicles on unpaved and paved roads.

Rights-of-Way Corridors Emissions Estimation

Criteria pollutant emissions from rights-of-way corridors operations were calculated based on data provided by the Kemmerer Field Office and used best available information, BACT, AP-42, and the emission studies from other BLM documents. Estimated emissions include the following:

- Fugitive dust and combustive emissions from construction of roads, telephone and fiber optics, powerlines, pipelines (mineral/water), communication sites, and other facilities
- Fugitive dust and combustive emissions for commuting vehicle road traffic.

Off-Highway Vehicles Emission Estimation

Criteria pollutant emissions from off-highway vehicles were calculated based on data provided by the Kemmerer Field Office and used best available information, BACT, AP-42, and the emission studies from other BLM documents. Off-highway vehicles include all terrain vehicles, motorcycles, and snowmobiles.

Road Maintenance Emission Estimation

Criteria pollutant emissions from road maintenance activities (excluding well road maintenance) were calculated based on data provided by the Kemmerer Field Office and used best available information, BACT, AP-42, and the emission studies from other BLM documents. Estimated emissions include fugitive dust and combustive emissions resulting from the use of a grader. It was assumed that road maintenance would occur twice in the summer and once in the winter.

Geophysical Exploration Emissions Estimation

Criteria pollutant emissions from geophysical exploration surveys on BLM-administered surface were calculated based on data provided by the Kemmerer Field Office and used the best available information from EPA's AP-42 document, EPA's MOBILE6.2 emissions model, air emissions inventory guidance from the U.S. Air Force, and other emission studies. Other information about the emission calculations is presented below:

- Discussions with the Kemmerer Field Office staff were the basis for making assumptions on the frequency, duration and amount of equipment used during typical geophysical exploration surveys.
- Combustive emissions were calculated from support vehicles used in geophysical exploration, including trucks, vans, ATVs, and helicopters.
- Emissions of fugitive dust (PM_{10}) from geophysical exploration surveys was not calculated because of the uncertainties in determining the extent of off-road travel during the surveys. It is believed that off-road travel is a minor source of emissions during the surveys, compared to other potential activities that occur in the Kemmerer Field Office.

Summary of Emissions for All BLM Activities

Tables J-6 through J-113 summarizes the projected annual emissions by resource for activities occurring on BLM-administered surface. In most cases, year 2011 and 2020 are presented. These years vary for select resources.

Table J-6. Summary of Output – Alternative A
Total Annual Emissions from Coalbed Natural Gas Wells – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	5.73	0.86	---	---	---	---	---
Heavy Equipment Combustive Emissions[a]	0.24	0.24	4.75	0.15	0.97	0.28	0.03
Commuting Vehicles – Construction	1.38	0.21	0.04	0.01	0.10	0.02	0.00
Sub-total: Construction	**7.35**	**1.31**	**4.78**	**0.16**	**1.07**	**0.30**	**0.03**
Natural Gas Compression - Operations[a]	4.00	4.00	22.21	0.04	44.43	22.21	3.55
Separator, Dehydrator & Water Tank Heaters - Operations[a]	0.01	0.01	0.07	0.00	0.06	0.00	0.00
Station Visits - Operations	3.82	0.57	0.02	0.00	0.19	0.01	0.00
Well Workover - Operations	1.07	0.17	0.22	0.00	0.05	0.01	0.00
Well & Pipeline visits for Inspection & Repair - Operations	2.44	0.36	0.01	0.00	0.12	0.01	0.00
Sub-total: Operations	**11.33**	**5.11**	**22.53**	**0.05**	**44.86**	**22.25**	**3.56**
Road Maintenance	0.34	0.04	0.09	0.00	0.02	0.01	0.00
Sub-total: Maintenance	**0.34**	**0.04**	**0.09**	**0.00**	**0.02**	**0.01**	**0.00**
Road Reclamation	0.04	0.04	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.06**	**0.04**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total Emissions	**19.07**	**6.50**	**27.41**	**0.21**	**45.95**	**22.56**	**3.59**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-7. Summary of Output – Alternative A
Total Annual Emissions from Coalbed Natural Gas Wells – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	5.73	0.86	---	---	---	---	---
Heavy Equipment Combustive Emissions[a]	0.24	0.24	4.75	0.15	0.97	0.28	0.03
Commuting Vehicles - Construction	1.38	0.21	0.04	0.01	0.10	0.02	0.00
Sub-total: Construction	**7.35**	**1.31**	**4.78**	**0.16**	**1.07**	**0.30**	**0.03**
Natural Gas Compression - Operations[a]	9.87	9.87	54.83	0.11	109.65	54.83	8.77
Separator, Dehydrator & Water Tank Heaters - Operations[a]	0.01	0.01	0.18	0.00	0.15	0.01	0.00
Station Visits - Operations	9.43	1.41	0.02	0.00	0.19	0.01	0.001
Well Workover - Operations	2.06	0.31	0.02	0.00	0.01	0.01	0.001
Well & Pipeline visits for Inspection & Repair - Operations	4.75	0.71	0.02	0.00	0.24	0.02	0.002
Sub-total: Operations	**26.12**	**12.31**	**55.06**	**0.12**	**110.25**	**54.87**	**8.78**
Road Maintenance	0.66	0.06	0.01	0.001	0.01	0.01	0.001
Sub-total: Maintenance	**0.66**	**0.06**	**0.01**	**0.001**	**0.01**	**0.01**	**0.001**
Road Reclamation	0.04	0.04	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.06**	**0.04**	**0.00**	**0.0000**	**0.00**	**0.000**	**0.0000**
Total Emissions	**34.18**	**13.73**	**59.86**	**0.27**	**111.33**	**55.18**	**8.81**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-8. Summary of Output – Alternative B
Total Annual Emissions from Coalbed Natural Gas Wells – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	2.60	0.39	---	---	---	---	---
Heavy Equipment Combustive Emissions[a]	0.11	0.11	2.15	0.07	0.44	0.13	0.01
Commuting Vehicles - Construction	0.63	0.10	0.02	0.00	0.05	0.01	0.00
Sub-total: Construction	**3.33**	**0.59**	**2.17**	**0.07**	**0.49**	**0.14**	**0.01**
Natural Gas Compression - Operations[a]	1.78	1.78	9.90	0.02	19.80	9.90	1.58
Separator, Dehydrator & Water Tank Heaters - Operations[a]	0.00	0.00	0.03	0.00	0.03	0.00	0.00
Station Visits - Operations	1.70	0.26	0.01	0.00	0.09	0.01	0.00
Well Workover - Operations	0.46	0.07	0.10	0.00	0.02	0.01	0.00
Well & Pipeline visits for Inspection & Repair - Operations	1.05	0.16	0.00	0.00	0.05	0.00	0.00
Sub-total: Operations	**5.00**	**2.27**	**10.04**	**0.02**	**19.99**	**9.92**	**1.59**
Road Maintenance	0.15	0.02	0.04	0.00	0.01	0.00	0.00
Sub-total: Maintenance	**0.15**	**0.02**	**0.04**	**0.00**	**0.01**	**0.00**	**0.00**
Road Reclamation	0.04	0.04	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.06**	**0.04**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total Emissions	**8.54**	**2.92**	**12.26**	**0.09**	**20.49**	**10.05**	**1.60**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-9. Summary of Output – Alternative B
Total Annual Emissions from Coalbed Natural Gas Wells – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	2.60	0.39	---	---	---	---	---
Heavy Equipment Combustive Emissions[a]	0.11	0.11	2.15	0.07	0.44	0.13	0.01
Commuting Vehicles - Construction	0.63	0.10	0.02	0.00	0.05	0.01	0.00
Sub-total: Construction	**3.33**	**0.59**	**2.17**	**0.07**	**0.49**	**0.14**	**0.01**
Natural Gas Compression - Operations[a]	4.09	4.09	22.70	0.05	45.41	22.70	3.63
Separator, Dehydrator & Water Tank Heaters - Operations[a]	0.01	0.01	0.07	0.00	0.06	0.00	0.00
Station Visits - Operations	3.90	0.58	0.01	0.00	0.09	0.01	0.001
Well Workover - Operations	0.86	0.13	0.01	0.00	0.01	0.00	0.000
Well & Pipeline visits for Inspection & Repair - Operations	1.98	0.30	0.01	0.00	0.10	0.01	0.001
Sub-total: Operations	**10.84**	**5.10**	**22.80**	**0.05**	**45.66**	**22.72**	**3.63**
Road Maintenance	0.27	0.03	0.01	0.000	0.00	0.00	0.000
Sub-total: Maintenance	**0.27**	**0.03**	**0.01**	**0.000**	**0.00**	**0.00**	**0.000**
Road Reclamation	0.04	0.04	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.06**	**0.04**	**0.00**	**0.0000**	**0.00**	**0.000**	**0.0000**
Total Emissions	**14.50**	**5.77**	**24.98**	**0.12**	**46.15**	**22.86**	**3.65**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-10. Summary of Output – Alternative C
Total Annual Emissions from Coalbed Natural Gas Wells – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	5.73	0.86	---	---	---	---	---
Heavy Equipment Combustive Emissions[a]	0.24	0.24	4.75	0.15	0.97	0.28	0.03
Commuting Vehicles - Construction	1.38	0.21	0.04	0.01	0.10	0.02	0.00
Sub-total: Construction	**7.35**	**1.31**	**4.78**	**0.16**	**1.07**	**0.30**	**0.03**
Natural Gas Compression - Operations[a]	3.78	3.78	21.01	0.04	42.01	21.01	3.36
Separator, Dehydrator & Water Tank Heaters - Operations[a]	0.01	0.01	0.07	0.00	0.06	0.00	0.00
Station Visits - Operations	3.61	0.54	0.02	0.00	0.18	0.01	0.00
Well Workover - Operations	1.03	0.16	0.22	0.00	0.05	0.01	0.00
Well & Pipeline visits for Inspection & Repair - Operations	2.36	0.35	0.01	0.00	0.12	0.01	0.00
Sub-total: Operations	**10.79**	**4.84**	**21.32**	**0.05**	**42.43**	**21.04**	**3.36**
Road Maintenance	0.33	0.04	0.09	0.00	0.02	0.01	0.00
Sub-total: Maintenance	**0.33**	**0.04**	**0.09**	**0.00**	**0.02**	**0.01**	**0.00**
Road Reclamation	0.04	0.04	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.06**	**0.04**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total Emissions	**18.52**	**6.23**	**26.20**	**0.20**	**43.52**	**21.35**	**3.40**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-11. Summary of Output – Alternative C
Total Annual Emissions from Coalbed Natural Gas Wells – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	5.73	0.86	---	---	---	---	---
Heavy Equipment Combustive Emissions [a]	0.24	0.24	4.75	0.15	0.97	0.28	0.03
Commuting Vehicles - Construction	1.38	0.21	0.04	0.01	0.10	0.02	0.00
Sub-total: Construction	**7.35**	**1.31**	**4.78**	**0.16**	**1.07**	**0.30**	**0.03**
Natural Gas Compression - Operations [a]	9.56	9.56	53.08	0.11	106.17	53.08	8.49
Separator, Dehydrator & Water Tank Heaters - Operations [a]	0.01	0.01	0.17	0.00	0.14	0.01	0.00
Station Visits - Operations	9.13	1.37	0.02	0.00	0.18	0.01	0.001
Well Workover - Operations	2.01	0.30	0.02	0.00	0.01	0.01	0.001
Well & Pipeline visits for Inspection & Repair - Operations	4.62	0.69	0.02	0.00	0.24	0.02	0.002
Sub-total: Operations	**25.32**	**11.93**	**53.31**	**0.11**	**106.74**	**53.13**	**8.50**
Road Maintenance	0.64	0.06	0.01	0.001	0.01	0.01	0.001
Sub-total: Maintenance	**0.64**	**0.06**	**0.01**	**0.001**	**0.01**	**0.01**	**0.001**
Road Reclamation	0.04	0.04	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.06**	**0.04**	**0.00**	**0.0000**	**0.00**	**0.000**	**0.0000**
Total Emissions	**33.36**	**13.34**	**58.11**	**0.27**	**107.83**	**53.43**	**8.53**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-12. Summary of Output – Alternative D (Proposed RMP)
Total Annual Emissions from Coalbed Natural Gas Wells – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	5.73	0.86	---	---	---	---	---
Heavy Equipment Combustive Emissions[a]	0.24	0.24	4.75	0.15	0.97	0.28	0.03
Commuting Vehicles - Construction	1.38	0.21	0.04	0.01	0.10	0.02	0.00
Sub-total: Construction	**7.35**	**1.31**	**4.78**	**0.16**	**1.07**	**0.30**	**0.03**
Natural Gas Compression - Operations[a]	3.78	3.78	21.01	0.04	42.01	21.01	3.36
Separator, Dehydrator & Water Tank Heaters - Operations[a]	0.01	0.01	0.07	0.00	0.06	0.00	0.00
Station Visits - Operations	3.61	0.54	0.02	0.00	0.18	0.01	0.00
Well Workover - Operations	1.03	0.16	0.22	0.00	0.05	0.01	0.00
Well & Pipeline visits for Inspection & Repair - Operations	2.36	0.35	0.01	0.00	0.12	0.01	0.00
Sub-total: Operations	**10.79**	**4.84**	**21.32**	**0.05**	**42.43**	**21.04**	**3.36**
Road Maintenance	0.33	0.04	0.09	0.00	0.02	0.01	0.00
Sub-total: Maintenance	**0.33**	**0.04**	**0.09**	**0.00**	**0.02**	**0.01**	**0.00**
Road Reclamation	0.04	0.04	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.06**	**0.04**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total Emissions	**18.52**	**6.23**	**26.20**	**0.20**	**43.52**	**21.35**	**3.40**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-13. Summary of Output – Alternative D (Proposed RMP) Total Annual Emissions from Coalbed Natural Gas Wells – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	5.73	0.86	---	---	---	---	---
Heavy Equipment Combustive Emissions [a]	0.24	0.24	4.75	0.15	0.97	0.28	0.03
Commuting Vehicles - Construction	1.38	0.21	0.04	0.01	0.10	0.02	0.00
Sub-total: Construction	**7.35**	**1.31**	**4.78**	**0.16**	**1.07**	**0.30**	**0.03**
Natural Gas Compression - Operations [a]	9.55	9.55	53.06	0.11	106.11	53.06	8.49
Separator, Dehydrator & Water Tank Heaters - Operations [a]	0.01	0.01	0.17	0.00	0.14	0.01	0.00
Station Visits - Operations	9.12	1.37	0.02	0.00	0.18	0.01	0.001
Well Workover - Operations	2.00	0.30	0.02	0.00	0.01	0.01	0.001
Well & Pipeline visits for Inspection & Repair - Operations	4.60	0.69	0.02	0.00	0.23	0.02	0.002
Sub-total: Operations	**25.28**	**11.92**	**53.28**	**0.11**	**106.69**	**53.10**	**8.49**
Road Maintenance	0.63	0.06	0.01	0.001	0.01	0.01	0.001
Sub-total: Maintenance	**0.63**	**0.06**	**0.01**	**0.001**	**0.01**	**0.01**	**0.001**
Road Reclamation	0.04	0.04	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.06**	**0.04**	**0.00**	**0.0000**	**0.00**	**0.000**	**0.0000**
Total Emissions	**33.32**	**13.33**	**58.08**	**0.27**	**107.77**	**53.41**	**8.52**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-14. Summary of Output – Alternative A
Total Annual Emissions from Natural Gas Wells – Year 2001 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	10.36	1.55	---	---	---	---	---
Heavy Equipment Combustive Emissions [a]	6.78	6.78	140.92	3.03	45.59	11.50	1.15
Well Completion Flaring	0.15	0.15	1.34	57.33	7.29	65.11	6.51
Commuting Vehicles - Construction	16.18	2.73	1.77	0.35	4.57	1.07	0.11
Sub-total: Construction	**33.47**	**11.22**	**144.03**	**60.71**	**57.44**	**77.68**	**7.77**
Natural Gas Compression & Pneumatic Pumps - Operations [a]	8.65	8.65	130.98	0.26	261.96	132.73	21.13
Separator, Dehydrator & Water Tank Heaters - Operations [a]	43.38	43.38	570.76	3.42	479.44	5,409.92	540.99
Station Visits - Operations	8.32	1.25	0.04	0.00	0.42	0.03	0.00
Well Workover - Operations	0.17	0.06	1.51	0.01	0.30	0.06	0.01
Well & Pipeline visits for Inspection & Repair - Operations	14.81	2.22	0.07	0.01	0.75	0.05	0.00
Tanks Condensate and Loadout	---	---	---	---	---	523.90	52.39
Sub-total: Operations	**75.33**	**55.56**	**703.35**	**3.71**	**742.88**	**6,066.69**	**614.53**
Road Maintenance	2.56	0.31	1.44	0.03	0.48	0.12	0.01
Sub-total: Maintenance	**2.56**	**0.31**	**1.44**	**0.03**	**0.48**	**0.12**	**0.01**
Road Reclamation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total Emissions	**111.37**	**67.09**	**848.82**	**64.44**	**800.80**	**6,144.48**	**622.31**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-15. Summary of Output – Alternative A
Total Annual Emissions from Natural Gas Wells – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	21.43	3.21	---	---	---	---	---
Heavy Equipment Combustive Emissions [a]	7.38	7.38	209.39	6.29	31.62	9.39	0.94
Well Completion Flaring	0.17	0.17	1.59	68.17	8.67	77.43	7.74
Commuting Vehicles - Construction	33.57	5.67	3.67	0.72	9.47	2.21	0.22
Sub-total: Construction	**62.56**	**16.45**	**214.66**	**75.18**	**49.76**	**89.02**	**8.90**
Natural Gas Compression & Pneumatic Pumps - Operations [a]	12.47	12.47	188.80	0.38	377.59	191.32	30.46
Separator, Dehydrator & Water Tank Heaters - Operations [a]	62.48	62.48	822.12	4.93	690.58	4,485.13	448.51
Station Visits - Operations	12.00	1.80	0.05	0.01	0.61	0.04	0.00
Well Workover - Operations	0.35	0.13	3.13	0.02	0.63	0.13	0.01
Well & Pipeline visits for Inspection & Repair - Operations	21.35	3.20	0.09	0.01	1.09	0.07	0.01
Tanks Condensate and Loadout	---	---	---	---	---	432.47	43.25
Sub-total: Operations	**108.64**	**80.08**	**1,014.19**	**5.34**	**1,070.49**	**5,109.16**	**522.24**
Road Maintenance	3.64	0.39	1.01	0.01	0.24	0.09	0.01
Sub-total: Maintenance	**3.64**	**0.39**	**1.01**	**0.01**	**0.24**	**0.09**	**0.01**
Road Reclamation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total Emissions	**174.86**	**96.92**	**1,229.86**	**80.53**	**1,120.49**	**5,198.27**	**531.15**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-16. Summary of Output – Alternative A
Total Annual Emissions from Natural Gas Wells – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	21.43	3.21	---	---	---	---	---
Heavy Equipment Combustive Emissions [a]	7.38	7.38	209.39	6.29	31.62	9.39	0.94
Well Completion Flaring	0.17	0.17	1.59	68.17	8.67	77.43	7.74
Commuting Vehicles - Construction	33.57	5.67	3.67	0.72	9.47	2.21	0.22
Sub-total: Construction	**62.56**	**16.45**	**214.66**	**75.18**	**49.76**	**89.02**	**8.90**
Natural Gas Compression & Pneumatic Pumps - Operations [a]	16.19	16.19	245.24	0.49	490.49	248.52	39.57
Separator, Dehydrator & Water Tank Heaters - Operations [a]	81.15	81.15	1067.70	6.41	896.87	4563.03	456.30
Station Visits - Operations	15.58	2.33	0.07	0.01	0.79	0.05	0.005
Well Workover - Operations	0.27	0.05	0.21	0.02	0.07	0.10	0.010
Well & Pipeline visits for Inspection & Repair - Operations	27.73	4.15	0.12	0.01	1.41	0.09	0.009
Tanks Condensate and Loadout	---	---	---	---	---	438.74	43.87
Sub-total: Operations	**140.92**	**103.88**	**1313.34**	**6.93**	**1389.63**	**5250.53**	**539.77**
Road Maintenance	4.67	0.46	0.09	0.007	0.06	0.04	0.004
Sub-total: Maintenance	**4.67**	**0.46**	**0.09**	**0.007**	**0.06**	**0.04**	**0.004**
Road Reclamation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.01**	**0.00**	**0.00**	**0.0000**	**0.00**	**0.000**	**0.0000**
Total Emissions	**208.16**	**120.78**	**1,528.09**	**82.12**	**1,439.45**	**5,339.60**	**548.67**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-17. Summary of Output – Alternative B
Total Annual Emissions from Natural Gas Wells – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	11.11	1.67	---	---	---	---	---
Heavy Equipment Combustive Emissions[a]	3.82	3.82	108.25	3.25	16.35	4.85	0.49
Well Completion Flaring	0.08	0.08	0.72	30.90	3.93	35.09	3.51
Commuting Vehicles - Construction	17.36	2.93	1.90	0.37	4.90	1.14	0.11
Sub-total: Construction	**32.37**	**8.50**	**110.87**	**34.52**	**25.18**	**41.09**	**4.11**
Natural Gas Compression & Pneumatic Pumps - Operations[a]	10.07	10.07	152.45	0.30	304.90	154.49	24.60
Separator, Dehydrator & Water Tank Heaters - Operations[a]	50.45	50.45	663.76	3.98	557.56	3,180.39	318.04
Station Visits - Operations	9.69	1.45	0.04	0.00	0.49	0.03	0.00
Well Workover - Operations	0.18	0.07	1.62	0.01	0.32	0.06	0.01
Well & Pipeline visits for Inspection & Repair - Operations	17.24	2.58	0.08	0.01	0.88	0.06	0.01
Tanks Condensate and Loadout	---	---	---	---	---	306.23	30.62
Sub-total: Operations	**87.62**	**64.62**	**817.95**	**4.31**	**864.15**	**3,641.26**	**373.27**
Road Maintenance	2.94	0.32	0.82	0.00	0.19	0.07	0.01
Sub-total: Maintenance	**2.94**	**0.32**	**0.82**	**0.00**	**0.19**	**0.07**	**0.01**
Road Reclamation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total Emissions	**122.94**	**73.43**	**929.64**	**38.83**	**889.52**	**3,682.41**	**377.39**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-18. Summary of Output – Alternative B
Total Annual Emissions from Natural Gas Wells – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	**$PM_{2.5}$**	**NO_x**	**SO_2**	**CO**	**VOC**	**HAPs[b]**
Well Pad & Station Construction - Fugitive Dust	11.11	1.67	---	---	---	---	---
Heavy Equipment Combustive Emissions [a]	3.82	3.82	108.25	3.25	16.35	4.85	0.49
Well Completion Flaring	0.08	0.08	0.72	30.90	3.93	35.09	3.51
Commuting Vehicles - Construction	17.36	2.93	1.90	0.37	4.90	1.14	0.11
Sub-total: Construction	**32.37**	**8.50**	**110.87**	**34.52**	**25.18**	**41.09**	**4.11**
Natural Gas Compression & Pneumatic Pumps - Operations [a]	11.56	11.56	174.99	0.35	349.99	177.33	28.23
Separator, Dehydrator & Water Tank Heaters - Operations [a]	57.89	57.89	761.77	4.57	639.88	2730.84	273.08
Station Visits - Operations	11.12	1.67	0.05	0.01	0.57	0.04	0.004
Well Workover - Operations	0.14	0.02	0.11	0.01	0.04	0.05	0.005
Well & Pipeline visits for Inspection & Repair - Operations	19.79	2.96	0.09	0.01	1.01	0.06	0.006
Tanks Condensate and Loadout	---	---	---	---	---	261.92	26.19
Sub-total: Operations	**100.49**	**74.10**	**937.00**	**4.94**	**991.48**	**3170.24**	**327.52**
Road Maintenance	3.33	0.33	0.07	0.005	0.04	0.03	0.003
Sub-total: Maintenance	**3.33**	**0.33**	**0.07**	**0.005**	**0.04**	**0.03**	**0.003**
Road Reclamation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.01**	**0.00**	**0.00**	**0.0000**	**0.00**	**0.000**	**0.0000**
Total Emissions	**136.21**	**82.93**	**1,047.94**	**39.47**	**1,016.70**	**3,211.36**	**331.64**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-19. Summary of Output – Alternative C
Total Annual Emissions from Natural Gas Wells – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM$_{10}$	**PM$_{2.5}$**	**NO$_x$**	**SO$_2$**	**CO**	**VOC**	**HAPs[b]**
Well Pad & Station Construction - Fugitive Dust	21.43	3.21	---	---	---	---	---
Heavy Equipment Combustive Emissions[a]	7.38	7.38	209.39	6.29	31.62	9.39	0.94
Well Completion Flaring	0.17	0.17	1.59	68.25	8.68	77.52	7.75
Commuting Vehicles - Construction	33.57	5.67	3.67	0.72	9.47	2.21	0.22
Sub-total: Construction	**62.56**	**16.45**	**214.66**	**75.26**	**49.77**	**89.11**	**8.91**
Natural Gas Compression & Pneumatic Pumps - Operations[a]	12.49	12.49	189.18	0.38	378.36	191.71	30.52
Separator, Dehydrator & Water Tank Heaters - Operations[a]	62.61	62.61	823.78	4.94	691.98	4,499.39	449.94
Station Visits - Operations	12.02	1.80	0.05	0.01	0.61	0.04	0.00
Well Workover - Operations	0.35	0.13	3.13	0.02	0.63	0.13	0.01
Well & Pipeline visits for Inspection & Repair - Operations	21.39	3.20	0.09	0.01	1.09	0.07	0.01
Tanks Condensate and Loadout	---	---	---	---	---	433.85	43.39
Sub-total: Operations	**108.86**	**80.24**	**1,016.23**	**5.35**	**1,072.66**	**5,125.18**	**523.87**
Road Maintenance	3.64	0.40	1.02	0.01	0.24	0.09	0.01
Sub-total: Maintenance	**3.64**	**0.40**	**1.02**	**0.01**	**0.24**	**0.09**	**0.01**
Road Reclamation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total Emissions	**175.08**	**97.08**	**1,231.91**	**80.62**	**1,122.67**	**5,214.38**	**532.79**

[a] PM$_{2.5}$ assumed = PM$_{10}$ for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-20. Summary of Output – Alternative C
Total Annual Emissions from Natural Gas Wells – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	21.43	3.21	---	---	---	---	---
Heavy Equipment Combustive Emissions[a]	7.38	7.38	209.39	6.29	31.62	9.39	0.94
Well Completion Flaring	0.17	0.17	1.59	68.25	8.68	77.52	7.75
Commuting Vehicles - Construction	33.57	5.67	3.67	0.72	9.47	2.21	0.22
Sub-total: Construction	**62.56**	**16.45**	**214.66**	**75.26**	**49.77**	**89.11**	**8.91**
Natural Gas Compression & Pneumatic Pumps - Operations[a]	16.24	16.24	246.01	0.49	492.01	249.30	39.69
Separator, Dehydrator & Water Tank Heaters - Operations[a]	81.40	81.40	1071.02	6.43	899.66	4584.42	458.44
Station Visits - Operations	15.63	2.34	0.07	0.01	0.80	0.05	0.005
Well Workover - Operations	0.27	0.05	0.21	0.02	0.07	0.10	0.010
Well & Pipeline visits for Inspection & Repair - Operations	27.82	4.17	0.12	0.01	1.42	0.09	0.009
Tanks Condensate and Loadout	---	---	---	---	---	440.81	44.08
Sub-total: Operations	**141.36**	**104.20**	**1317.43**	**6.95**	**1393.96**	**5274.77**	**542.24**
Road Maintenance	4.68	0.46	0.09	0.007	0.06	0.04	0.004
Sub-total: Maintenance	**4.68**	**0.46**	**0.09**	**0.007**	**0.06**	**0.04**	**0.004**
Road Reclamation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.01**	**0.00**	**0.00**	**0.0000**	**0.00**	**0.000**	**0.0000**
Total Emissions	**208.62**	**121.11**	**1,532.18**	**82.22**	**1,443.79**	**5,363.93**	**551.15**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-21. Summary of Output – Alternative D (Proposed RMP)
Total Annual Emissions from Natural Gas Wells – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	21.43	3.21	---	---	---	---	---
Heavy Equipment Combustive Emissions [a]	7.38	7.38	209.39	6.29	31.62	9.39	0.94
Well Completion Flaring	0.17	0.17	1.59	68.06	8.65	77.31	7.73
Commuting Vehicles - Construction	33.57	5.67	3.67	0.72	9.47	2.21	0.22
Sub-total: Construction	**62.56**	**16.45**	**214.66**	**75.08**	**49.75**	**88.91**	**8.89**
Natural Gas Compression & Pneumatic Pumps - Operations [a]	12.43	12.43	188.29	0.38	376.57	190.80	30.38
Separator, Dehydrator & Water Tank Heaters - Operations [a]	62.31	62.31	819.89	4.92	688.71	4,466.17	446.62
Station Visits - Operations	11.96	1.79	0.05	0.01	0.61	0.04	0.00
Well Workover - Operations	0.35	0.13	3.13	0.02	0.63	0.13	0.01
Well & Pipeline visits for Inspection & Repair - Operations	21.29	3.19	0.09	0.01	1.08	0.07	0.01
Tanks Condensate and Loadout	---	---	---	---	---	430.64	43.06
Sub-total: Operations	**108.35**	**79.86**	**1,011.45**	**5.33**	**1,067.60**	**5,087.84**	**520.08**
Road Maintenance	3.63	0.39	1.01	0.01	0.24	0.09	0.01
Sub-total: Maintenance	**3.63**	**0.39**	**1.01**	**0.01**	**0.24**	**0.09**	**0.01**
Road Reclamation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total Emissions	**174.55**	**96.70**	**1,227.12**	**80.41**	**1,117.58**	**5,176.83**	**528.98**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-22. Summary of Output – Alternative D (Proposed RMP)
Total Annual Emissions from Natural Gas Wells – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM$_{10}$	PM$_{2.5}$	NO$_x$	SO$_2$	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	21.43	3.21	---	---	---	---	---
Heavy Equipment Combustive Emissions[a]	7.38	7.38	209.39	6.29	31.62	9.39	0.94
Well Completion Flaring	0.17	0.17	1.59	68.06	8.65	77.31	7.73
Commuting Vehicles - Construction	33.57	5.67	3.67	0.72	9.47	2.21	0.22
Sub-total: Construction	**62.56**	**16.45**	**214.66**	**75.08**	**49.75**	**88.91**	**8.89**
Natural Gas Compression & Pneumatic Pumps - Operations[a]	16.15	16.15	244.51	0.49	489.03	247.78	39.45
Separator, Dehydrator & Water Tank Heaters - Operations[a]	80.90	80.90	1064.52	6.39	894.20	4551.16	455.12
Station Visits - Operations	15.54	2.33	0.07	0.01	0.79	0.05	0.005
Well Workover - Operations	0.27	0.05	0.21	0.02	0.07	0.10	0.010
Well & Pipeline visits for Inspection & Repair - Operations	27.65	4.14	0.12	0.01	1.41	0.09	0.009
Tanks Condensate and Loadout	---	---	---	---	---	437.60	43.76
Sub-total: Operations	**140.50**	**103.57**	**1309.44**	**6.91**	**1385.50**	**5236.79**	**538.35**
Road Maintenance	4.66	0.46	0.09	0.007	0.06	0.04	0.004
Sub-total: Maintenance	**4.66**	**0.46**	**0.09**	**0.007**	**0.06**	**0.04**	**0.004**
Road Reclamation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.01**	**0.00**	**0.00**	**0.0000**	**0.00**	**0.000**	**0.0000**
Total Emissions	**207.73**	**120.47**	**1,524.19**	**81.99**	**1,435.30**	**5,325.73**	**547.24**

[a] PM$_{2.5}$ assumed = PM$_{10}$ for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-23. Summary of Output – Alternative A
Total Annual Emissions from Oil Wells – Year 2001 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	0.07	0.01	---	---	---	---	---
Heavy Equipment Combustive Emissions & Flaring[a]	0.18	0.18	6.08	0.82	1.52	0.19	0.02
Commuting Vehicles - Construction	0.11	0.02	0.00	0.00	0.01	0.00	0.00
Sub-total: Construction	**0.36**	**0.21**	**6.08**	**0.82**	**1.53**	**0.19**	**0.02**
Well Workover Operations - Fugitive Dust	0.00	0.00	---	---	---	---	---
Well Workover Operations - On-site Exhaust	0.01	0.01	0.15	0.01	0.03	0.01	0.00
Well Workover Operations - On-road Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Visits for Inspection & Repair - Operations	0.11	0.02	0.00	0.00	0.01	0.00	0.00
Sub-total: Operations	**0.12**	**0.03**	**0.15**	**0.01**	**0.04**	**0.01**	**0.00**
Road Maintenance	0.08	0.01	0.04	0.00	0.01	0.00	0.00
Sub-total: Maintenance	**0.08**	**0.01**	**0.04**	**0.00**	**0.01**	**0.00**	**0.00**
Total Emissions	**0.57**	**0.25**	**6.27**	**0.83**	**1.57**	**0.20**	**0.02**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1

Table J-24. Summary of Output – Alternative A
Total Annual Emissions from Oil Wells – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	0.14	0.02	---	---	---	---	---
Heavy Equipment Combustive Emissions & Flaring [a]	0.38	0.38	12.63	1.69	3.15	0.39	0.04
Commuting Vehicles - Construction	0.24	0.04	0.01	0.00	0.02	0.00	0.00
Sub-total: Construction	**0.76**	**0.44**	**12.63**	**1.70**	**3.17**	**0.39**	**0.04**
Well Workover Operations - Fugitive Dust	0.00	0.00	---	---	---	---	---
Well Workover Operations - On-site Exhaust	0.02	0.02	0.31	0.02	0.07	0.03	0.00
Well Workover Operations - On-road Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Visits for Inspection & Repair - Operations	0.16	0.02	0.00	0.00	0.01	0.00	0.00
Sub-total: Operations	**0.18**	**0.05**	**0.31**	**0.02**	**0.08**	**0.03**	**0.00**
Road Maintenance	0.12	0.02	0.05	0.01	0.01	0.00	0.00
Sub-total: Maintenance	**0.12**	**0.02**	**0.05**	**0.01**	**0.01**	**0.00**	**0.00**
Total Emissions	**1.06**	**0.50**	**13.00**	**1.72**	**3.26**	**0.42**	**0.04**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1

Table J-25. Summary of Output – Alternative A
Total Annual Emissions from Oil Wells – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	0.14	0.02	---	---	---	---	---
Heavy Equipment Combustive Emissions & Flaring [a]	0.38	0.38	12.63	1.69	3.15	0.39	0.04
Commuting Vehicles - Construction	0.24	0.04	0.01	0.00	0.02	0.00	0.00
Sub-total: Construction	**0.76**	**0.44**	**12.63**	**1.70**	**3.17**	**0.39**	**0.04**
Well Workover Operations - Fugitive Dust	0.00	0.00	---	---	---	---	---
Well Workover Operations - On-site Exhaust	0.02	0.02	0.31	0.02	0.07	0.03	0.00
Well Workover Operations - On-road Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Well Visits for Inspection & Repair - Operations	0.21	0.03	0.00	0.00	0.01	0.00	0.000
Sub-total: Operations	**0.23**	**0.05**	**0.31**	**0.02**	**0.08**	**0.03**	**0.00**
Road Maintenance	0.25	0.03	0.12	0.014	0.03	0.01	0.001
Sub-total: Maintenance	**0.25**	**0.03**	**0.12**	**0.014**	**0.03**	**0.01**	**0.001**
Total Emissions	**1.24**	**0.52**	**13.06**	**1.73**	**3.27**	**0.42**	**0.04**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1

Table J-26. Summary of Output – Alternative B
Total Annual Emissions from Oil Wells – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	0.07	0.01	---	---	---	---	---
Heavy Equipment Combustive Emissions & Flaring[a]	0.19	0.19	6.53	0.88	1.63	0.20	0.02
Commuting Vehicles - Construction	0.12	0.02	0.00	0.00	0.01	0.00	0.00
Sub-total: Construction	**0.39**	**0.22**	**6.53**	**0.88**	**1.64**	**0.20**	**0.02**
Well Workover Operations - Fugitive Dust	0.00	0.00	---	---	---	---	---
Well Workover Operations - On-site Exhaust	0.01	0.01	0.16	0.01	0.03	0.01	0.00
Well Workover Operations - On-road Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Visits for Inspection & Repair - Operations	0.13	0.02	0.00	0.00	0.01	0.00	0.00
Sub-total: Operations	**0.14**	**0.03**	**0.16**	**0.01**	**0.04**	**0.01**	**0.00**
Road Maintenance	0.09	0.01	0.04	0.01	0.01	0.00	0.00
Sub-total: Maintenance	**0.09**	**0.01**	**0.04**	**0.01**	**0.01**	**0.00**	**0.00**
Total Emissions	**0.63**	**0.27**	**6.74**	**0.89**	**1.69**	**0.22**	**0.02**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1

Table J-27. Summary of Output – Alternative B
Total Annual Emissions from Oil Wells – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	**$PM_{2.5}$**	**NO_x**	**SO_2**	**CO**	**VOC**	**HAPs[b]**
Well Pad & Station Construction - Fugitive Dust	0.07	0.01	---	---	---	---	---
Heavy Equipment Combustive Emissions & Flaring [a]	0.19	0.19	6.53	0.88	1.63	0.20	0.02
Commuting Vehicles - Construction	0.12	0.02	0.00	0.00	0.01	0.00	0.00
Sub-total: Construction	**0.39**	**0.22**	**6.53**	**0.88**	**1.64**	**0.20**	**0.02**
Well Workover Operations - Fugitive Dust	0.00	0.00	---	---	---	---	---
Well Workover Operations - On-site Exhaust	0.01	0.01	0.16	0.01	0.03	0.01	0.00
Well Workover Operations - On-road Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Well Visits for Inspection & Repair - Operations	0.15	0.02	0.00	0.00	0.01	0.00	0.000
Sub-total: Operations	**0.16**	**0.03**	**0.16**	**0.01**	**0.04**	**0.01**	**0.00**
Road Maintenance	0.18	0.02	0.08	0.010	0.02	0.00	0.000
Sub-total: Maintenance	**0.18**	**0.02**	**0.08**	**0.010**	**0.02**	**0.00**	**0.000**
Total Emissions	**0.73**	**0.28**	**6.78**	**0.90**	**1.70**	**0.22**	**0.02**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1

Table J-28. Summary of Output – Alternative C
Total Annual Emissions from Oil Wells – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	0.14	0.02	---	---	---	---	---
Heavy Equipment Combustive Emissions & Flaring[a]	0.38	0.38	12.63	1.69	3.15	0.39	0.04
Commuting Vehicles - Construction	0.24	0.04	0.01	0.00	0.02	0.00	0.00
Sub-total: Construction	**0.76**	**0.44**	**12.63**	**1.70**	**3.17**	**0.39**	**0.04**
Well Workover Operations - Fugitive Dust	0.00	0.00	---	---	---	---	---
Well Workover Operations - On-site Exhaust	0.02	0.02	0.31	0.02	0.07	0.03	0.00
Well Workover Operations - On-road Exhaust–	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Visits for Inspection & Repair - Operations–	0.16	0.02	0.00	0.00	0.01	0.00	0.00
Sub-total: Operations	**0.18**	**0.05**	**0.31**	**0.02**	**0.08**	**0.03**	**0.00**
Road Maintenance	0.12	0.02	0.05	0.01	0.01	0.00	0.00
Sub-total: Maintenance	**0.12**	**0.02**	**0.05**	**0.01**	**0.01**	**0.00**	**0.00**
Total Emissions	**1.06**	**0.50**	**13.00**	**1.72**	**3.26**	**0.42**	**0.04**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1

Table J-29. Summary of Output – Alternative C
Total Annual Emissions from Oil Wells – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	0.14	0.02	---	---	---	---	---
Heavy Equipment Combustive Emissions & Flaring [a]	0.38	0.38	12.63	1.69	3.15	0.39	0.04
Commuting Vehicles - Construction	0.24	0.04	0.01	0.00	0.02	0.00	0.00
Sub-total: Construction	**0.76**	**0.44**	**12.63**	**1.70**	**3.17**	**0.39**	**0.04**
Well Workover Operations - Fugitive Dust	0.00	0.00	---	---	---	---	---
Well Workover Operations - On-site Exhaust	0.02	0.02	0.31	0.02	0.07	0.03	0.00
Well Workover Operations - On-road Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Well Visits for Inspection & Repair - Operations	0.21	0.03	0.00	0.00	0.01	0.00	0.000
Sub-total: Operations	**0.23**	**0.05**	**0.31**	**0.02**	**0.08**	**0.03**	**0.00**
Road Maintenance	0.25	0.03	0.12	0.014	0.03	0.01	0.001
Sub-total: Maintenance	**0.25**	**0.03**	**0.12**	**0.014**	**0.03**	**0.01**	**0.001**
Total Emissions	**1.24**	**0.52**	**13.06**	**1.73**	**3.27**	**0.42**	**0.04**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1

Table J-30. Summary of Output - Alternative D (Proposed RMP) Total Annual Emissions from Oil Wells – Year 2011 (BLM-Administered Surface)

	Annual Emissions (Tons)						
Activity	**PM_{10}**	**$PM_{2.5}$**	**NO_x**	**SO_2**	**CO**	**VOC**	**HAPs[b]**
Well Pad & Station Construction - Fugitive Dust	0.14	0.02	---	---	---	---	---
Heavy Equipment Combustive Emissions & Flaring [a]	0.38	0.38	12.63	1.69	3.15	0.39	0.04
Commuting Vehicles - Construction	0.24	0.04	0.01	0.00	0.02	0.00	0.00
Sub-total: Construction	**0.76**	**0.44**	**12.63**	**1.70**	**3.17**	**0.39**	**0.04**
Well Workover Operations - Fugitive Dust	0.00	0.00	---	---	---	---	---
Well Workover Operations - On-site Exhaust	0.02	0.02	0.31	0.02	0.07	0.03	0.00
Well Workover Operations - On-road Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Visits for Inspection & Repair - Operations	0.16	0.02	0.00	0.00	0.01	0.00	0.00
Sub-total: Operations	**0.18**	**0.05**	**0.31**	**0.02**	**0.08**	**0.03**	**0.00**
Road Maintenance	0.12	0.02	0.05	0.01	0.01	0.00	0.00
Sub-total: Maintenance	**0.12**	**0.02**	**0.05**	**0.01**	**0.01**	**0.00**	**0.00**
Total Emissions	**1.06**	**0.50**	**13.00**	**1.72**	**3.26**	**0.42**	**0.04**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1

Table J-31. Summary of Output – Alternative D (Proposed RMP)
Total Annual Emissions from Oil Wells – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	0.14	0.02	---	---	---	---	---
Heavy Equipment Combustive Emissions & Flaring [a]	0.38	0.38	12.63	1.69	3.15	0.39	0.04
Commuting Vehicles - Construction	0.24	0.04	0.01	0.00	0.02	0.00	0.00
Sub-total: Construction	**0.76**	**0.44**	**12.63**	**1.70**	**3.17**	**0.39**	**0.04**
Well Workover Operations - Fugitive Dust	0.00	0.00	---	---	---	---	---
Well Workover Operations - On-site Exhaust	0.02	0.02	0.31	0.02	0.07	0.03	0.00
Well Workover Operations - On-road Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Well Visits for Inspection & Repair - Operations	0.21	0.03	0.00	0.00	0.01	0.00	0.000
Sub-total: Operations	**0.23**	**0.05**	**0.31**	**0.02**	**0.08**	**0.03**	**0.00**
Road Maintenance	0.25	0.03	0.12	0.014	0.03	0.01	0.001
Sub-total: Maintenance	**0.25**	**0.03**	**0.12**	**0.014**	**0.03**	**0.01**	**0.001**
Total Emissions	**1.23**	**0.52**	**13.06**	**1.73**	**3.27**	**0.42**	**0.04**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1

Table J-32. All Alternatives
Total Annual Emissions from Coal Mining Operations (BLM-Administered Surface)

	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Total Emissions - 2001	**407.1**	**142.1**	**1320.3**	**1.5**	**285.1**	**0**	**0**
Total Emissions - 2011	**452.3**	**157.9**	**1467.0**	**1.7**	**316.8**	**0**	**0**
Total Emissions - 2020	**452.3**	**157.9**	**1467.0**	**1.7**	**316.8**	**0**	**0**

Source: Potter 2006; Easley 2006

[a] $PM_{2.5}$ = PM_{10} * 0.349 for this source (EPA 1999)

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Note the following assumptions:

1. Emissions for PM10, NOx, SOx, CO, VOCs and HAPs are actual emissions from 2001 as reported by Potter (2006).
2. PM2.5 emissions are not included in Potter (2006). PM2.5 emissions are estimated based on the ratio of PM2.5 to PM10 emissions for this mine as reported by EPA (1999).
3. Future emissions are estimated based on ratio of current to future production (current = 4.5 million tons/yr, future = 5.0 million tons/yr). Easley (2006) provided the production info, and MacDonald (2006) provided the method for projecting emissions.

Table J-33. All Alternatives
Total Annual Emissions from Trona Mining and Processing Operations – Year 2001 (BLM-Administered Surface)

	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[a]
FMC Granger	65.50	65.50	495.20	107.00	635.70	183.00	1.05
FMC Wyoming Green River Soda Ash facility	870.40	870.40	258.80	0.00	105.70	251.00	109.70
General Chemical	838.90	838.90	2810.10	4896.20	238.50	5103.50	127.70
Solvay	159.30	159.30	1291.00	40.10	3509.80	1667.20	234.80
Total Emissions	**1934.10**	**1934.10**	**4855.10**	**5043.30**	**4489.70**	**7204.70**	**473.25**

Source: Bott 2006

[a] HAPs = Hazardous Air Pollutants

Note the following assumptions:

1. Emissions for PM2.5 assumed equal to PM10.
2. Emissions for PM10, NOx, SO2, CO, VOCs, HAPs reported by Bott 2006.
3. Emissions projected constant for 2011 and 2020 based on no projected change in trona production (CREG 2006).

Table J-34. Summary of Output – Alternative A
Annual Emissions Estimation for Salable Minerals Equipment Usage – Year 2001 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Sand Handling, Transfer, and Storage	250.35	27.54	9.92	---	---	---	---
Unpaved Roads	0.78	0.12	---	---	---	---	---
Commuting Vehicles - Exhaust	0.01	0.01	0.03	0.01	0.06	0.02	0.00
Batch Drop Operations	0.91	0.29	---	---	---	---	---
Heavy Equipment - Dust	37.05	5.56	---	---	---	---	---
Heavy Equipment - Combustive	0.50	0.50	10.40	0.22	3.35	0.84	0.08
Total	**289.59**	**34.00**	**20.35**	**0.23**	**3.41**	**0.86**	**0.09**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-35. Summary of Output – Alternative A
Annual Emissions Estimation for Salable Minerals Equipment Usage – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Sand Handling, Transfer, and Storage	250.35	27.54	9.92	---	---	---	---
Unpaved Roads	0.78	0.12	---	---	---	---	---
Commuting Vehicles – Exhaust	0.01	0.01	0.03	0.01	0.06	0.02	0.00
Batch Drop Operations	0.91	0.29	---	---	---	---	---
Heavy Equipment – Dust	37.05	5.56	---	---	---	---	---
Heavy Equipment – Combustive	0.16	0.16	5.00	0.02	1.15	0.33	0.03
Total	**289.26**	**33.67**	**14.95**	**0.03**	**1.21**	**0.35**	**0.03**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-36. Summary of Output – Alternative A
Annual Emissions Estimation for Salable Minerals Equipment Usage – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Sand Handling, Transfer, and Storage	250.35	27.54	9.92	---	---	---	---
Unpaved Roads	0.78	0.12	---	---	---	---	---
Commuting Vehicles - Exhaust	0.01	0.01	0.03	0.01	0.06	0.02	0.00
Batch Drop Operations	0.91	0.29	---	---	---	---	---
Heavy Equipment - Dust	37.05	5.56	---	---	---	---	---
Heavy Equipment - Combustive	0.01	0.01	0.35	0.02	0.12	0.16	0.02
Total	**289.11**	**33.52**	**10.29**	**0.03**	**0.18**	**0.18**	**0.02**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-37. Summary of Output – Alternative B
Annual Emissions Estimation for Salable Minerals Equipment Usage – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Sand Handling, Transfer, and Storage	232.83	25.61	9.23	---	---	---	---
Unpaved Roads	0.73	0.11	---	---	---	---	---
Commuting Vehicles - Exhaust	0.01	0.01	0.03	0.00	0.06	0.02	0.00
Batch Drop Operations	0.84	0.27	---	---	---	---	---
Heavy Equipment - Dust	35.43	5.31	---	---	---	---	---
Heavy Equipment - Combustive	0.15	0.15	4.65	0.02	1.07	0.31	0.03
Total	**269.98**	**31.45**	**13.90**	**0.03**	**1.12**	**0.32**	**0.03**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-38. Summary of Output – Alternative B
Annual Emissions Estimation for Salable Minerals Equipment Usage – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Sand Handling, Transfer, and Storage	232.83	25.61	9.23	---	---	---	---
Unpaved Roads	0.73	0.11	---	---	---	---	---
Commuting Vehicles - Exhaust	0.01	0.01	0.03	0.00	0.06	0.02	0.00
Batch Drop Operations	0.84	0.27	---	---	---	---	---
Heavy Equipment - Dust	35.43	5.31	---	---	---	---	---
Heavy Equipment - Combustive	0.01	0.01	0.32	0.02	0.11	0.15	0.02
Total	**269.84**	**31.32**	**9.57**	**0.03**	**0.17**	**0.17**	**0.02**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-39. Summary of Output – Alternative C
Annual Emissions Estimation for Salable Minerals Equipment Usage – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Sand Handling, Transfer, and Storage	250.35	27.54	9.92	---	---	---	---
Unpaved Roads	0.78	0.12	---	---	---	---	---
Commuting Vehicles – Exhaust	0.01	0.01	0.03	0.01	0.06	0.02	0.00
Batch Drop Operations	0.91	0.29	---	---	---	---	---
Heavy Equipment – Dust	37.05	5.56	---	---	---	---	---
Heavy Equipment – Combustive	0.16	0.16	5.00	0.02	1.15	0.33	0.03
Total	**289.26**	**33.67**	**14.95**	**0.03**	**1.21**	**0.35**	**0.03**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-40. Summary of Output – Alternative C
Annual Emissions Estimation for Salable Minerals Equipment Usage – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Sand Handling, Transfer, and Storage	250.35	27.54	9.92	---	---	---	---
Unpaved Roads	0.78	0.12	---	---	---	---	---
Commuting Vehicles - Exhaust	0.01	0.01	0.03	0.01	0.06	0.02	0.00
Batch Drop Operations	0.91	0.29	---	---	---	---	---
Heavy Equipment - Dust	37.05	5.56	---	---	---	---	---
Heavy Equipment - Combustive	0.01	0.01	0.35	0.02	0.12	0.16	0.02
Total	**289.11**	**33.52**	**10.29**	**0.03**	**0.18**	**0.18**	**0.02**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-41. Summary of Output – Alternative D (Proposed RMP)
Annual Emissions Estimation for Salable Minerals Equipment Usage – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Sand Handling, Transfer, and Storage	250.35	27.54	9.92	---	---	---	---
Unpaved Roads	0.78	0.12	---	---	---	---	---
Commuting Vehicles - Exhaust	0.01	0.01	0.03	0.01	0.06	0.02	0.00
Batch Drop Operations	0.91	0.29	---	---	---	---	---
Heavy Equipment - Dust	37.05	5.56	---	---	---	---	---
Heavy Equipment - Combustive	0.16	0.16	5.00	0.02	1.15	0.33	0.03
Total	**289.26**	**33.67**	**14.95**	**0.03**	**1.21**	**0.35**	**0.03**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-42. Summary of Output – Alternative D (Proposed RMP)
Annual Emissions Estimation for Salable Minerals Equipment Usage – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM$_{10}$	PM$_{2.5}$[a]	NO$_x$	SO$_2$	CO	VOC	HAPs[b]
Sand Handling, Transfer, and Storage	250.35	27.54	9.92	---	---	---	---
Unpaved Roads	0.78	0.12	---	---	---	---	---
Commuting Vehicles - Exhaust	0.01	0.01	0.03	0.01	0.06	0.02	0.00
Batch Drop Operations	0.91	0.29	---	---	---	---	---
Heavy Equipment - Dust	37.05	5.56	---	---	---	---	---
Heavy Equipment - Combustive	0.01	0.01	0.35	0.02	0.12	0.16	0.02
Total	**289.11**	**33.52**	**10.29**	**0.03**	**0.18**	**0.18**	**0.02**

[a] Emission factor for PM$_{2.5}$ = PM$_{10}$ for combustive emissions.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-43. Summary of Output – Alternative A
Annual Emissions Estimation for Locatable Minerals Equipment Usage – Year 2001 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM$_{10}$	PM$_{2.5}$[a]	NO$_x$	SO$_2$	CO	VOC	HAPs[b]
Product Handling, Transfer, and Storage[c]	---	---	---	---	---	---	---
Unpaved Roads	0.30	0.04	---	---	---	---	---
Commuting - Exhaust	0.05	0.04	0.20	0.04	0.42	0.12	0.01
Heavy Equipment - Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Combustive	0.87	0.87	17.09	0.37	5.70	1.45	0.15
Total	**1.22**	**0.96**	**17.28**	**0.41**	**6.11**	**1.57**	**0.16**

[a] Emission factor for PM$_{2.5}$ = PM$_{10}$ for combustive emissions.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1
[c] Handling (including batch drop), transfer, and storage does not apply since locatable operations are primarily building stone.

Table J-44. Summary of Output – Alternative A
Annual Emissions Estimation for Locatable Minerals Equipment Usage – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Product Handling, Transfer, and Storage[c]	---	---	---	---	---	---	---
Unpaved Roads	0.30	0.04	---	---	---	---	---
Commuting - Exhaust	0.05	0.04	0.20	0.04	0.42	0.12	0.01
Heavy Equipment - Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Combustive	0.29	0.29	8.88	0.04	1.95	0.44	0.04
Total	**0.63**	**0.37**	**9.08**	**0.08**	**2.36**	**0.56**	**0.06**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

[c] Handling (including batch drop), transfer, and storage does not apply since locatable operations are primarily building stone.

Table J-45. Summary of Output – Alternative A
Annual Emissions Estimation for Locatable Minerals Equipment Usage – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Product Handling, Transfer, and Storage[c]	---	---	---	---	---	---	---
Unpaved Roads	0.30	0.04	---	---	---	---	---
Commuting - Exhaust	0.05	0.04	0.20	0.04	0.42	0.12	0.01
Heavy Equipment - Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Combustive	0.02	0.02	0.58	0.04	0.19	0.27	0.03
Total	**0.37**	**0.11**	**0.78**	**0.08**	**0.60**	**0.39**	**0.04**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

[c] Handling (including batch drop), transfer, and storage does not apply since locatable operations are primarily building stone.

Table J-46. Summary of Output – Alternative B
Annual Emissions Estimation for Locatable Minerals Equipment Usage – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Product Handling, Transfer, and Storage[c]	---	---	---	---	---	---	---
Unpaved Roads	0.15	0.02	---	---	---	---	---
Commuting - Exhaust	0.02	0.02	0.10	0.02	0.21	0.06	0.01
Heavy Equipment - Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Combustive	0.14	0.14	4.44	0.02	0.97	0.22	0.02
Total	**0.32**	**0.19**	**4.54**	**0.04**	**1.18**	**0.28**	**0.03**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

[c] Handling (including batch drop), transfer, and storage does not apply since locatable operations are primarily building stone.

Table J-47. Summary of Output – Alternative B
Annual Emissions Estimation for Locatable Minerals Equipment Usage – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Product Handling, Transfer, and Storage[c]	---	---	---	---	---	---	---
Unpaved Roads	0.15	0.02	---	---	---	---	---
Commuting - Exhaust	0.02	0.02	0.10	0.02	0.21	0.06	0.01
Heavy Equipment - Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Combustive	0.01	0.01	0.29	0.02	0.09	0.13	0.01
Total	**0.18**	**0.05**	**0.39**	**0.04**	**0.30**	**0.19**	**0.02**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

[c] Handling (including batch drop), transfer, and storage does not apply since locatable operations are primarily building stone.

Table J-48. Summary of Output – Alternative C
Annual Emissions Estimation for Locatable Minerals Equipment Usage – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Product Handling, Transfer, and Storage[c]	---	---	---	---	---	---	---
Unpaved Roads	0.30	0.04	---	---	---	---	---
Commuting - Exhaust	0.05	0.04	0.20	0.04	0.42	0.12	0.01
Heavy Equipment - Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Combustive	0.29	0.29	8.88	0.04	1.95	0.44	0.04
Total	**0.63**	**0.37**	**9.08**	**0.08**	**2.36**	**0.56**	**0.06**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1
[c] Handling (including batch drop), transfer, and storage does not apply since locatable operations are primarily building stone.

Table J-49. Summary of Output – Alternative C
Annual Emissions Estimation for Locatable Minerals Equipment Usage – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Product Handling, Transfer, and Storage[c]	---	---	---	---	---	---	---
Unpaved Roads	0.30	0.04	---	---	---	---	---
Commuting - Exhaust	0.05	0.04	0.20	0.04	0.42	0.12	0.01
Heavy Equipment - Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Combustive	0.02	0.02	0.58	0.04	0.19	0.27	0.03
Total	**0.37**	**0.11**	**0.78**	**0.08**	**0.60**	**0.39**	**0.04**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1
[c] Handling (including batch drop), transfer, and storage does not apply since locatable operations are primarily building stone.

Table J-50. Summary of Output – Alternative D (Proposed RMP) Annual Emissions Estimation for Locatable Minerals Equipment Usage – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Sand Handling, Transfer, and Storage[c]	---	---	---	---	---	---	---
Unpaved Roads	0.15	0.02	---	---	---	---	---
Commuting - Exhaust	0.02	0.02	0.10	0.02	0.21	0.06	0.01
Heavy Equipment - Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Combustive	0.14	0.14	4.44	0.02	0.97	0.22	0.02
Total	**0.32**	**0.19**	**4.54**	**0.04**	**1.18**	**0.28**	**0.03**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

[c] Handling (including batch drop), transfer, and storage does not apply since locatable operations are primarily building stone.

Table J-51. Summary of Output – Alternative D (Proposed RMP) Annual Emissions Estimation for Locatable Minerals Equipment Usage – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Sand Handling, Transfer, and Storage[c]	---	---	---	---	---	---	---
Unpaved Roads	0.15	0.02	---	---	---	---	---
Commuting - Exhaust	0.02	0.02	0.10	0.02	0.21	0.06	0.01
Heavy Equipment - Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Combustive	0.01	0.01	0.29	0.02	0.09	0.13	0.01
Total	**0.18**	**0.05**	**0.39**	**0.04**	**0.30**	**0.19**	**0.02**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

[c] Handling (including batch drop), transfer, and storage does not apply since locatable operations are primarily building stone.

Table J-52. Summary of Output – Alternative A
Total Annual Emissions from Renewable Energy Development – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	1,170.00	175.50	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.05	0.05	1.43	0.01	0.32	0.07	0.01
Sub-total: Heavy Equipment	**1,170.05**	**175.55**	**1.43**	**0.01**	**0.32**	**0.07**	**0.01**
Commuting Vehicles - Fugitive Dust	20.75	3.10	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.11	0.10	0.48	0.09	1.43	0.29	0.03
Sub-total: Commuting Vehicles	**20.86**	**3.20**	**0.48**	**0.09**	**1.43**	**0.29**	**0.03**
Total	**1,190.90**	**178.75**	**1.91**	**0.10**	**1.75**	**0.36**	**0.04**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Note: For alternatives A and B, the one activity is assigned to year 2011 for analysis purposes. For alternatives C and D, it is assumed that at most one activity occurs in a given year.

Table J-53. Summary of Output – Alternative A
Total Annual Emissions from Renewable Energy Development – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Heavy Equipment	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Commuting Vehicles - Fugitive Dust	0.00	0.00	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Commuting Vehicles	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Note: For alternatives A and B, the one activity is assigned to year 2011 for analysis purposes. For alternatives C and D, it is assumed that at most one activity occurs in a given year.

Table J-54. Summary of Output – Alternative B
Total Annual Emissions from Renewable Energy Development – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	1,170.00	175.50	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.05	0.05	1.43	0.01	0.32	0.07	0.01
Sub-total: Heavy Equipment	**1,170.05**	**175.55**	**1.43**	**0.01**	**0.32**	**0.07**	**0.01**
Commuting Vehicles - Fugitive Dust	20.75	3.10	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.11	0.10	0.48	0.09	1.43	0.29	0.03
Sub-total: Commuting Vehicles	**20.86**	**3.20**	**0.48**	**0.09**	**1.43**	**0.29**	**0.03**
Total	**1,190.90**	**178.75**	**1.91**	**0.10**	**1.75**	**0.36**	**0.04**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Note: For alternatives A and B, the one activity is assigned to year 2011 for analysis purposes. For alternatives C and D, it is assumed that at most one activity occurs in a given year.

Table J-55. Summary of Output – Alternative B
Total Annual Emissions from Renewable Energy Development – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Heavy Equipment	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Commuting Vehicles - Fugitive Dust	0.00	0.00	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Commuting Vehicles	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Note: For alternatives A and B, the one activity is assigned to year 2011 for analysis purposes. For alternatives C and D, it is assumed that at most one activity occurs in a given year.

Table J-56. Summary of Output – Alternative C
Total Annual Emissions from Renewable Energy Development – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	1,170.00	175.50	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.05	0.05	1.43	0.01	0.32	0.07	0.01
Sub-total: Heavy Equipment	**1,170.05**	**175.55**	**1.43**	**0.01**	**0.32**	**0.07**	**0.01**
Commuting Vehicles - Fugitive Dust	20.75	3.10	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.11	0.10	0.48	0.09	1.43	0.29	0.03
Sub-total: Commuting Vehicles	**20.86**	**3.20**	**0.48**	**0.09**	**1.43**	**0.29**	**0.03**
Total	**1,190.90**	**178.75**	**1.91**	**0.10**	**1.75**	**0.36**	**0.04**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Note: For alternatives A and B, the one activity is assigned to year 2011 for analysis purposes. For alternatives C and D, it is assumed that at most one activity occurs in a given year.

Table J-57. Summary of Output – Alternative C
Total Annual Emissions from Renewable Energy Development – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	1,170.00	175.50	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.09	0.01	0.03	0.04	0.00
Sub-total: Heavy Equipment	**1,170.00**	**175.50**	**0.09**	**0.01**	**0.03**	**0.04**	**0.00**
Commuting Vehicles - Fugitive Dust	20.75	3.10	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.11	0.10	0.48	0.09	1.43	0.29	0.03
Sub-total: Commuting Vehicles	**20.86**	**3.20**	**0.48**	**0.09**	**1.43**	**0.29**	**0.03**
Total	**1,190.86**	**178.71**	**0.57**	**0.10**	**1.46**	**0.33**	**0.03**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Note: For alternatives A and B, the one activity is assigned to year 2011 for analysis purposes. For alternatives C and D, it is assumed that at most one activity occurs in a given year.

Table J-58. Summary of Output – Alternative D (Proposed RMP) Total Annual Emissions from Renewable Energy Development – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	1,170.00	175.50	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.05	0.05	1.43	0.01	0.32	0.07	0.01
Sub-total: Heavy Equipment	**1,170.05**	**175.55**	**1.43**	**0.01**	**0.32**	**0.07**	**0.01**
Commuting Vehicles - Fugitive Dust	20.75	3.10	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.11	0.10	0.48	0.09	1.43	0.29	0.03
Sub-total: Commuting Vehicles	**20.86**	**3.20**	**0.48**	**0.09**	**1.43**	**0.29**	**0.03**
Total	**1,190.90**	**178.75**	**1.91**	**0.10**	**1.75**	**0.36**	**0.04**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Note: For alternatives A and B, the one activity is assigned to year 2011 for analysis purposes. For alternatives C and D, it is assumed that at most one activity occurs in a given year.

Table J-59. Summary of Output – Alternative D (Proposed RMP) Total Annual Emissions from Renewable Energy Development – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	585.00	87.75	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.05	0.00	0.02	0.02	0.00
Sub-total: Heavy Equipment	**585.00**	**87.75**	**0.05**	**0.00**	**0.02**	**0.02**	**0.00**
Commuting Vehicles - Fugitive Dust	10.92	1.63	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.06	0.05	0.25	0.05	0.75	0.15	0.02
Sub-total: Commuting Vehicles	**10.98**	**1.69**	**0.25**	**0.05**	**0.75**	**0.15**	**0.02**
Total	**595.98**	**89.44**	**0.30**	**0.05**	**0.77**	**0.17**	**0.02**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Note: For alternatives A and B, the one activity is assigned to year 2011 for analysis purposes. For alternatives C and D, it is assumed that at most one activity occurs in a given year.

Table J-60. Summary of Output – Alternative A
Total Annual Emissions from Livestock Grazing Projects – Year 2001 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	**$PM_{2.5}$**	**NO_x**	**SO_2**	**CO**	**VOC**	**HAPs[b]**
Fugitive Dust	0.87	0.13	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.05	0.05	1.07	0.02	0.36	0.09	0.01
Sub-total: Heavy Equipment	**0.92**	**0.18**	**1.07**	**0.02**	**0.36**	**0.09**	**0.01**
Commuting Vehicles - Fugitive Dust	1.43	0.21	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.01	0.01	0.05	0.01	0.16	0.03	0.00
Sub-total: Commuting Vehicles	**1.44**	**0.22**	**0.05**	**0.01**	**0.16**	**0.03**	**0.00**
Total	**2.36**	**0.41**	**1.12**	**0.03**	**0.52**	**0.12**	**0.01**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-61. Summary of Output – Alternative A
Total Annual Emissions from Livestock Grazing Projects – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	**$PM_{2.5}$**	**NO_x**	**SO_2**	**CO**	**VOC**	**HAPs[b]**
Heavy Equipment - Fugitive Dust	0.87	0.13	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.02	0.02	0.53	0.00	0.13	0.04	0.00
Sub-total: Heavy Equipment	**0.88**	**0.15**	**0.53**	**0.00**	**0.13**	**0.04**	**0.00**
Commuting Vehicles - Fugitive Dust	1.43	0.21	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.01	0.01	0.05	0.01	0.16	0.03	0.00
Sub-total: Commuting Vehicles	**1.44**	**0.22**	**0.05**	**0.01**	**0.16**	**0.03**	**0.00**
Total	**2.32**	**0.37**	**0.58**	**0.01**	**0.29**	**0.07**	**0.01**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-62. Summary of Output – Alternative A
Total Annual Emissions from Livestock Grazing Projects – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	**$PM_{2.5}$**	**NO_x**	**SO_2**	**CO**	**VOC**	**HAPs[b]**
Fugitive Dust	0.87	0.13	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.04	0.00	0.01	0.02	0.00
Sub-total: Heavy Equipment	**0.87**	**0.13**	**0.04**	**0.00**	**0.01**	**0.02**	**0.00**
Commuting Vehicles - Fugitive Dust	1.43	0.21	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.01	0.01	0.05	0.01	0.16	0.03	0.00
Sub-total: Commuting Vehicles	**1.44**	**0.22**	**0.05**	**0.01**	**0.16**	**0.03**	**0.00**
Total	**2.31**	**0.36**	**0.09**	**0.01**	**0.17**	**0.05**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-63. Summary of Output – Alternative B
Total Annual Emissions from Livestock Grazing Projects – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	**$PM_{2.5}$**	**NO_x**	**SO_2**	**CO**	**VOC**	**HAPs[b]**
Heavy Equipment - Fugitive Dust	0.87	0.13	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.02	0.02	0.53	0.00	0.13	0.04	0.00
Sub-total: Heavy Equipment	**0.88**	**0.15**	**0.53**	**0.00**	**0.13**	**0.04**	**0.00**
Commuting Vehicles - Fugitive Dust	1.43	0.21	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.01	0.01	0.05	0.01	0.16	0.03	0.00
Sub-total: Commuting Vehicles	**1.44**	**0.22**	**0.05**	**0.01**	**0.16**	**0.03**	**0.00**
Total	**2.32**	**0.37**	**0.58**	**0.01**	**0.29**	**0.07**	**0.01**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-64. Summary of Output – Alternative B
Total Annual Emissions from Livestock Grazing Projects – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	0.87	0.13	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.04	0.00	0.01	0.02	0.00
Sub-total: Heavy Equipment	**0.87**	**0.13**	**0.04**	**0.00**	**0.01**	**0.02**	**0.00**
Commuting Vehicles - Fugitive Dust	1.43	0.21	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.01	0.01	0.05	0.01	0.16	0.03	0.00
Sub-total: Commuting Vehicles	**1.44**	**0.22**	**0.05**	**0.01**	**0.16**	**0.03**	**0.00**
Total	**2.31**	**0.36**	**0.09**	**0.01**	**0.17**	**0.05**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-65. Summary of Output – Alternative C
Total Annual Emissions from Livestock Grazing Projects – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	0.87	0.13	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.02	0.02	0.53	0.00	0.13	0.04	0.00
Sub-total: Heavy Equipment	**0.88**	**0.15**	**0.53**	**0.00**	**0.13**	**0.04**	**0.00**
Commuting Vehicles - Fugitive Dust	1.43	0.21	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.01	0.01	0.05	0.01	0.16	0.03	0.00
Sub-total: Commuting Vehicles	**1.44**	**0.22**	**0.05**	**0.01**	**0.16**	**0.03**	**0.00**
Total	**2.32**	**0.37**	**0.58**	**0.01**	**0.29**	**0.07**	**0.01**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-66. Summary of Output – Alternative C
Total Annual Emissions from Livestock Grazing Projects – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	0.87	0.13	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.04	0.00	0.01	0.02	0.00
Sub-total: Heavy Equipment	**0.87**	**0.13**	**0.04**	**0.00**	**0.01**	**0.02**	**0.00**
Commuting Vehicles - Fugitive Dust	1.43	0.21	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.01	0.01	0.05	0.01	0.16	0.03	0.00
Sub-total: Commuting Vehicles	**1.44**	**0.22**	**0.05**	**0.01**	**0.16**	**0.03**	**0.00**
Total	**2.31**	**0.36**	**0.09**	**0.01**	**0.17**	**0.05**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-67. Summary of Output – Alternative D (Proposed RMP)
Total Annual Emissions from Livestock Grazing Projects – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	0.87	0.13	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.02	0.02	0.53	0.00	0.13	0.04	0.00
Sub-total: Heavy Equipment	**0.88**	**0.15**	**0.53**	**0.00**	**0.13**	**0.04**	**0.00**
Commuting Vehicles - Fugitive Dust	1.43	0.21	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.01	0.01	0.05	0.01	0.16	0.03	0.00
Sub-total: Commuting Vehicles	**1.44**	**0.22**	**0.05**	**0.01**	**0.16**	**0.03**	**0.00**
Total	**2.32**	**0.37**	**0.58**	**0.01**	**0.29**	**0.07**	**0.01**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-68. Summary of Output – Alternative D (Proposed RMP)
Total Annual Emissions from Livestock Grazing Projects – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	0.87	0.13	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.04	0.00	0.01	0.02	0.00
Sub-total: Heavy Equipment	**0.87**	**0.13**	**0.04**	**0.00**	**0.01**	**0.02**	**0.00**
Commuting Vehicles - Fugitive Dust	1.43	0.21	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.01	0.01	0.05	0.01	0.16	0.03	0.00
Sub-total: Commuting Vehicles	**1.44**	**0.22**	**0.05**	**0.01**	**0.16**	**0.03**	**0.00**
Total	**2.31**	**0.36**	**0.09**	**0.01**	**0.17**	**0.05**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-69. Summary of Output – Alternative A
Total Annual Emissions from Vegetation Projects – Year 2001 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	1.04	0.16	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Sub-total: Heavy Equipment	**1.04**	**0.16**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**
Commuting Vehicles - Fugitive Dust	0.83	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.01	0.00	0.05	0.00	0.00
Sub-total: Commuting Vehicles	**0.83**	**0.13**	**0.01**	**0.00**	**0.05**	**0.00**	**0.00**
Total	**1.87**	**0.28**	**0.02**	**0.00**	**0.05**	**0.01**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-70. Summary of Output – Alternative A
Total Annual Emissions from Vegetation Projects – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	1.04	0.16	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Sub-total: Heavy Equipment	**1.04**	**0.16**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**
Commuting Vehicles - Fugitive Dust	0.83	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.01	0.00	0.05	0.00	0.00
Sub-total: Commuting Vehicles	**0.83**	**0.13**	**0.01**	**0.00**	**0.05**	**0.00**	**0.00**
Total	**1.87**	**0.28**	**0.01**	**0.00**	**0.05**	**0.01**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-71. Summary of Output – Alternative A
Total Annual Emissions from Vegetation Projects – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	1.04	0.16	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Heavy Equipment	**1.04**	**0.16**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Commuting Vehicles - Fugitive Dust	0.83	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.01	0.00	0.05	0.00	0.00
Sub-total: Commuting Vehicles	**0.83**	**0.13**	**0.01**	**0.00**	**0.05**	**0.00**	**0.00**
Total	**1.87**	**0.28**	**0.01**	**0.00**	**0.05**	**0.01**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-72. Summary of Output – Alternative B
Total Annual Emissions from Vegetation Projects – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Sub-total: Heavy Equipment	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**
Commuting Vehicles - Fugitive Dust	0.83	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.01	0.00	0.05	0.00	0.00
Sub-total: Commuting Vehicles	**0.83**	**0.13**	**0.01**	**0.00**	**0.05**	**0.00**	**0.00**
Total	**0.83**	**0.13**	**0.01**	**0.00**	**0.05**	**0.01**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-73. Summary of Output – Alternative B
Total Annual Emissions from Vegetation Projects – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Heavy Equipment	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Commuting Vehicles - Fugitive Dust	0.83	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.01	0.00	0.05	0.00	0.00
Sub-total: Commuting Vehicles	**0.83**	**0.13**	**0.01**	**0.00**	**0.05**	**0.00**	**0.00**
Total	**0.83**	**0.13**	**0.01**	**0.00**	**0.05**	**0.01**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-74. Summary of Output – Alternative C
Total Annual Emissions from Vegetation Projects – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	1.04	0.16	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Sub-total: Heavy Equipment	**1.04**	**0.16**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**
Commuting Vehicles - Fugitive Dust	0.83	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.01	0.00	0.05	0.00	0.00
Sub-total: Commuting Vehicles	**0.83**	**0.13**	**0.01**	**0.00**	**0.05**	**0.00**	**0.00**
Total	**1.87**	**0.28**	**0.01**	**0.00**	**0.05**	**0.01**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-75. Summary of Output – Alternative C
Total Annual Emissions from Vegetation Projects – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	1.04	0.16	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Heavy Equipment	**1.04**	**0.16**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Commuting Vehicles - Fugitive Dust	0.83	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.01	0.00	0.05	0.00	0.00
Sub-total: Commuting Vehicles	**0.83**	**0.13**	**0.01**	**0.00**	**0.05**	**0.00**	**0.00**
Total	**1.87**	**0.28**	**0.01**	**0.00**	**0.05**	**0.01**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-76. Summary of Output – Alternative D (Proposed RMP) Total Annual Emissions from Vegetation Projects – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	1.04	0.16	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Sub-total: Heavy Equipment	**1.04**	**0.16**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**
Commuting Vehicles - Fugitive Dust	0.83	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.01	0.00	0.05	0.00	0.00
Sub-total: Commuting Vehicles	**0.83**	**0.13**	**0.01**	**0.00**	**0.05**	**0.00**	**0.00**
Total	**1.87**	**0.28**	**0.01**	**0.00**	**0.05**	**0.01**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-77. Summary of Output – Alternative D (Proposed RMP) Total Annual Emissions from Vegetation Projects – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	1.04	0.16	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Heavy Equipment	**1.04**	**0.16**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Commuting Vehicles - Fugitive Dust	0.83	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.01	0.00	0.05	0.00	0.00
Sub-total: Commuting Vehicles	**0.83**	**0.13**	**0.01**	**0.00**	**0.05**	**0.00**	**0.00**
Total	**1.87**	**0.28**	**0.01**	**0.00**	**0.05**	**0.01**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-78. Summary of Output – Alternative A
Total Annual Emissions from Fire Management Projects – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	67.60	10.14	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.02	0.02	0.21	0.00	0.88	0.30	0.03
Sub-total: Heavy Equipment	**67.62**	**10.16**	**0.21**	**0.00**	**0.88**	**0.30**	**0.03**
Commuting Vehicles - Fugitive Dust	0.79	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.02	0.02	0.06	0.01	0.29	0.17	0.02
Sub-total: Commuting Vehicles	**0.81**	**0.14**	**0.06**	**0.01**	**0.29**	**0.17**	**0.02**
Total	**68.43**	**10.30**	**0.27**	**0.01**	**1.16**	**0.46**	**0.05**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-79. Summary of Output – Alternative A
Total Annual Emissions from Fire Management Projects – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	67.60	10.14	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.02	0.02	0.02	0.00	0.68	0.12	0.01
Sub-total: Heavy Equipment	**67.62**	**10.16**	**0.02**	**0.00**	**0.68**	**0.12**	**0.01**
Commuting Vehicles - Fugitive Dust	0.79	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.02	0.02	0.06	0.01	0.29	0.17	0.02
Sub-total: Commuting Vehicles	**0.81**	**0.14**	**0.06**	**0.01**	**0.29**	**0.17**	**0.02**
Total	**68.43**	**10.29**	**0.07**	**0.01**	**0.96**	**0.29**	**0.03**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-80. Summary of Output – Alternative B
Total Annual Emissions from Fire Management Projects – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	67.60	10.14	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.02	0.02	0.21	0.00	0.88	0.30	0.03
Sub-total: Heavy Equipment	**67.62**	**10.16**	**0.21**	**0.00**	**0.88**	**0.30**	**0.03**
Commuting Vehicles - Fugitive Dust	0.79	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.02	0.02	0.06	0.01	0.29	0.17	0.02
Sub-total: Commuting Vehicles	**0.81**	**0.14**	**0.06**	**0.01**	**0.29**	**0.17**	**0.02**
Total	**68.43**	**10.30**	**0.27**	**0.01**	**1.16**	**0.46**	**0.05**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-81. Summary of Output – Alternative B
Total Annual Emissions from Fire Management Projects – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	67.60	10.14	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.02	0.02	0.02	0.00	0.68	0.12	0.01
Sub-total: Heavy Equipment	**67.62**	**10.16**	**0.02**	**0.00**	**0.68**	**0.12**	**0.01**
Commuting Vehicles - Fugitive Dust	0.79	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.02	0.02	0.06	0.01	0.29	0.17	0.02
Sub-total: Commuting Vehicles	**0.81**	**0.14**	**0.06**	**0.01**	**0.29**	**0.17**	**0.02**
Total	**68.43**	**10.29**	**0.07**	**0.01**	**0.96**	**0.29**	**0.03**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-82. Summary of Output – Alternative C
Total Annual Emissions from Fire Management Projects – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.02	0.02	0.11	0.00	0.86	0.29	0.03
Sub-total: Heavy Equipment	**0.02**	**0.02**	**0.11**	**0.00**	**0.86**	**0.29**	**0.03**
Commuting Vehicles - Fugitive Dust	0.49	0.07	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.01	0.01	0.04	0.01	0.24	0.16	0.02
Sub-total: Commuting Vehicles	**0.50**	**0.09**	**0.04**	**0.01**	**0.24**	**0.16**	**0.02**
Total	**0.53**	**0.11**	**0.15**	**0.01**	**1.10**	**0.45**	**0.04**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-83. Summary of Output – Alternative C
Total Annual Emissions from Fire Management Projects – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.02	0.02	0.01	0.00	0.68	0.12	0.01
Sub-total: Heavy Equipment	**0.02**	**0.02**	**0.01**	**0.00**	**0.68**	**0.12**	**0.01**
Commuting Vehicles - Fugitive Dust	0.49	0.07	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.01	0.01	0.04	0.01	0.24	0.16	0.02
Sub-total: Commuting Vehicles	**0.50**	**0.09**	**0.04**	**0.01**	**0.24**	**0.16**	**0.02**
Total	**0.52**	**0.11**	**0.05**	**0.01**	**0.92**	**0.27**	**0.03**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-84. Summary of Output – Alternative D (Proposed RMP) Total Annual Emissions from Fire Management Projects – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	67.60	10.14	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.02	0.02	0.21	0.00	0.88	0.30	0.03
Sub-total: Heavy Equipment	**67.62**	**10.16**	**0.21**	**0.00**	**0.88**	**0.30**	**0.03**
Commuting Vehicles - Fugitive Dust	0.79	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.02	0.02	0.06	0.01	0.29	0.17	0.02
Sub-total: Commuting Vehicles	**0.81**	**0.14**	**0.06**	**0.01**	**0.29**	**0.17**	**0.02**
Total	**68.43**	**10.30**	**0.27**	**0.01**	**1.16**	**0.46**	**0.05**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-85. Summary of Output – Alternative D (Proposed RMP) Total Annual Emissions from Fire Management Projects – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	67.60	10.14	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.02	0.02	0.02	0.00	0.68	0.12	0.01
Sub-total: Heavy Equipment	**67.62**	**10.16**	**0.02**	**0.00**	**0.68**	**0.12**	**0.01**
Commuting Vehicles - Fugitive Dust	0.79	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.02	0.02	0.06	0.01	0.29	0.17	0.02
Sub-total: Commuting Vehicles	**0.81**	**0.14**	**0.06**	**0.01**	**0.29**	**0.17**	**0.02**
Total	**68.43**	**10.29**	**0.07**	**0.01**	**0.96**	**0.29**	**0.03**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-86. Summary of Output – Alternative A
Total Annual Emissions from Forest and Woodlands Projects – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	6.50	0.98	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.01	0.01	0.00	0.00	0.23	0.08	0.01
Sub-total: Heavy Equipment	**6.51**	**0.98**	**0.00**	**0.00**	**0.23**	**0.08**	**0.01**
Commuting Vehicles - Fugitive Dust	0.59	0.09	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.01	0.00	0.04	0.01	0.00
Sub-total: Commuting Vehicles	**0.59**	**0.09**	**0.01**	**0.00**	**0.04**	**0.01**	**0.00**
Total	**7.10**	**1.07**	**0.01**	**0.00**	**0.27**	**0.09**	**0.01**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-87. Summary of Output – Alternative A
Total Annual Emissions from Forest and Woodlands Projects – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	6.50	0.98	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.01	0.01	0.00	0.00	0.19	0.03	0.00
Sub-total: Heavy Equipment	**6.51**	**0.98**	**0.00**	**0.00**	**0.19**	**0.03**	**0.00**
Commuting Vehicles - Fugitive Dust	0.59	0.09	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.01	0.00	0.04	0.01	0.00
Sub-total: Commuting Vehicles	**0.59**	**0.09**	**0.01**	**0.00**	**0.04**	**0.01**	**0.00**
Total	**7.10**	**1.07**	**0.01**	**0.00**	**0.23**	**0.04**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-88. Summary of Output – Alternative B
Total Annual Emissions from Forest and Woodlands Projects – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	**$PM_{2.5}$**	**NO_x**	**SO_2**	**CO**	**VOC**	**HAPs[b]**
Heavy Equipment - Fugitive Dust	5.20	0.78	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.00	0.00	0.19	0.06	0.01
Sub-total: Heavy Equipment	**5.20**	**0.78**	**0.00**	**0.00**	**0.19**	**0.06**	**0.01**
Commuting Vehicles - Fugitive Dust	0.47	0.07	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.01	0.00	0.03	0.01	0.00
Sub-total: Commuting Vehicles	**0.47**	**0.07**	**0.01**	**0.00**	**0.03**	**0.01**	**0.00**
Total	**5.68**	**0.86**	**0.01**	**0.00**	**0.22**	**0.07**	**0.01**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-89. Summary of Output – Alternative B
Total Annual Emissions from Forest and Woodlands Projects – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	**$PM_{2.5}$**	**NO_x**	**SO_2**	**CO**	**VOC**	**HAPs[b]**
Fugitive Dust	5.20	0.78	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.00	0.00	0.15	0.03	0.00
Sub-total: Heavy Equipment	**5.20**	**0.78**	**0.00**	**0.00**	**0.15**	**0.03**	**0.00**
Commuting Vehicles - Fugitive Dust	0.47	0.07	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.01	0.00	0.03	0.01	0.00
Sub-total: Commuting Vehicles	**0.47**	**0.07**	**0.01**	**0.00**	**0.03**	**0.01**	**0.00**
Total	**5.68**	**0.86**	**0.01**	**0.00**	**0.18**	**0.03**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-90. Summary of Output – Alternative C
Total Annual Emissions from Forest and Woodlands Projects – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	7.80	1.17	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.01	0.01	0.00	0.00	0.28	0.10	0.01
Sub-total: Heavy Equipment	**7.81**	**1.18**	**0.00**	**0.00**	**0.28**	**0.10**	**0.01**
Commuting Vehicles - Fugitive Dust	0.71	0.11	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.02	0.00	0.05	0.01	0.00
Sub-total: Commuting Vehicles	**0.71**	**0.11**	**0.02**	**0.00**	**0.05**	**0.01**	**0.00**
Total	**8.51**	**1.28**	**0.02**	**0.00**	**0.33**	**0.10**	**0.01**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-91. Summary of Output – Alternative C
Total Annual Emissions from Forest and Woodlands Projects – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	7.80	1.17	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.01	0.01	0.00	0.00	0.22	0.04	0.00
Sub-total: Heavy Equipment	**7.81**	**1.18**	**0.00**	**0.00**	**0.22**	**0.04**	**0.00**
Commuting Vehicles - Fugitive Dust	0.71	0.11	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.02	0.00	0.05	0.01	0.00
Sub-total: Commuting Vehicles	**0.71**	**0.11**	**0.02**	**0.00**	**0.05**	**0.01**	**0.00**
Total	**8.51**	**1.28**	**0.02**	**0.00**	**0.27**	**0.05**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-92. Summary of Output – Alternative D (Proposed RMP)
Total Annual Emissions from Forest and Woodlands Projects – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	7.80	1.17	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.01	0.01	0.00	0.00	0.28	0.10	0.01
Sub-total: Heavy Equipment	**7.81**	**1.18**	**0.00**	**0.00**	**0.28**	**0.10**	**0.01**
Commuting Vehicles - Fugitive Dust	0.71	0.11	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.02	0.00	0.05	0.01	0.00
Sub-total: Commuting Vehicles	**0.71**	**0.11**	**0.02**	**0.00**	**0.05**	**0.01**	**0.00**
Total	**8.51**	**1.28**	**0.02**	**0.00**	**0.33**	**0.10**	**0.01**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-93. Summary of Output – Alternative D (Proposed RMP)
Total Annual Emissions from Forest and Woodlands Projects – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	7.80	1.17	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.01	0.01	0.00	0.00	0.22	0.04	0.00
Sub-total: Heavy Equipment	**7.81**	**1.18**	**0.00**	**0.00**	**0.22**	**0.04**	**0.00**
Commuting Vehicles - Fugitive Dust	0.71	0.11	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.02	0.00	0.05	0.01	0.00
Sub-total: Commuting Vehicles	**0.71**	**0.11**	**0.02**	**0.00**	**0.05**	**0.01**	**0.00**
Total	**8.51**	**1.28**	**0.02**	**0.00**	**0.27**	**0.05**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-94. Summary of Output – Alternative A
Summary of ROWs and Corridors Emissions – Year 2001 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	2.85	0.43	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	49.25	49.25	883.78	19.56	307.65	79.49	7.95
Sub-total: Heavy Equipment	**52.10**	**49.68**	**883.78**	**19.56**	**307.65**	**79.49**	**7.95**
Commuting Vehicles - Fugitive Dust	18.55	2.77	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	2.08	1.91	8.75	1.73	20.62	5.23	0.52
Sub-total: Commuting Vehicles	**20.63**	**4.68**	**8.75**	**1.73**	**20.62**	**5.23**	**0.52**
Total	**72.73**	**54.36**	**892.53**	**21.29**	**328.28**	**84.72**	**8.47**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-95. Summary of Output – Alternative A
Summary of ROWs and Corridors Emissions – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	2.85	0.43	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	17.60	17.60	468.75	2.17	119.80	28.05	2.80
Sub-total: Heavy Equipment	**20.46**	**18.03**	**468.75**	**2.17**	**119.80**	**28.05**	**2.80**
Commuting Vehicles - Fugitive Dust	18.55	2.77	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	2.08	1.91	8.75	1.73	20.62	5.23	0.52
Sub-total: Commuting Vehicles	**20.63**	**4.68**	**8.75**	**1.73**	**20.62**	**5.23**	**0.52**
Total	**41.08**	**22.72**	**477.50**	**3.91**	**140.42**	**33.28**	**3.33**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-96. Summary of Output – Alternative A
Summary of ROWs and Corridors Emissions – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	2.85	0.43	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	1.20	1.20	61.70	2.17	11.88	14.13	1.41
Sub-total: Heavy Equipment	**4.05**	**1.63**	**61.70**	**2.17**	**11.88**	**14.13**	**1.41**
Commuting Vehicles - Fugitive Dust	18.55	2.77	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	2.08	1.91	8.75	1.73	20.62	5.23	0.52
Sub-total: Commuting Vehicles	**20.63**	**4.68**	**8.75**	**1.73**	**20.62**	**5.23**	**0.52**
Total	**24.68**	**6.31**	**70.45**	**3.91**	**32.51**	**19.36**	**1.94**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-97. Summary of Output – Alternative B
Summary of ROWs and Corridors Emissions – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	2.81	0.42	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	17.60	17.60	468.75	2.17	119.79	28.05	2.80
Sub-total: Heavy Equipment	**20.42**	**18.03**	**468.75**	**2.17**	**119.79**	**28.05**	**2.80**
Commuting Vehicles - Fugitive Dust	18.49	2.76	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	2.07	1.90	8.72	1.73	20.55	5.21	0.52
Sub-total: Commuting Vehicles	**20.56**	**4.67**	**8.72**	**1.73**	**20.55**	**5.21**	**0.52**
Total	**40.98**	**22.69**	**477.47**	**3.90**	**140.35**	**33.26**	**3.33**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-98. Summary of Output – Alternative B
Summary of ROWs and Corridors Emissions – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	2.81	0.42	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	1.20	1.20	61.70	2.17	11.88	14.13	1.41
Sub-total: Heavy Equipment	**4.02**	**1.62**	**61.70**	**2.17**	**11.88**	**14.13**	**1.41**
Commuting Vehicles - Fugitive Dust	18.49	2.76	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	2.07	1.90	8.72	1.73	20.55	5.21	0.52
Sub-total: Commuting Vehicles	**20.56**	**4.67**	**8.72**	**1.73**	**20.55**	**5.21**	**0.52**
Total	**24.58**	**6.29**	**70.41**	**3.90**	**32.44**	**19.34**	**1.93**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-99. Summary of Output – Alternative C
Summary of ROWs and Corridors Emissions – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	2.85	0.43	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	17.60	17.60	468.75	2.17	119.80	28.05	2.80
Sub-total: Heavy Equipment	**20.46**	**18.03**	**468.75**	**2.17**	**119.80**	**28.05**	**2.80**
Commuting Vehicles - Fugitive Dust	18.55	2.77	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	2.08	1.91	8.75	1.73	20.62	5.23	0.52
Sub-total: Commuting Vehicles	**20.63**	**4.68**	**8.75**	**1.73**	**20.62**	**5.23**	**0.52**
Total	**41.08**	**22.72**	**477.50**	**3.91**	**140.42**	**33.28**	**3.33**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-100. Summary of Output – Alternative C
Summary of ROWs and Corridors Emissions – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	2.85	0.43	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	1.20	1.20	61.70	2.17	11.88	14.13	1.41
Sub-total: Heavy Equipment	**4.05**	**1.63**	**61.70**	**2.17**	**11.88**	**14.13**	**1.41**
Commuting Vehicles - Fugitive Dust	18.55	2.77	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	2.08	1.91	8.75	1.73	20.62	5.23	0.52
Sub-total: Commuting Vehicles	**20.63**	**4.68**	**8.75**	**1.73**	**20.62**	**5.23**	**0.52**
Total	**24.68**	**6.31**	**70.45**	**3.91**	**32.51**	**19.36**	**1.94**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-101. Summary of Output – Alternative D (Proposed RMP)
Summary of ROWs and Corridors Emissions – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	2.85	0.43	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	17.60	17.60	468.75	2.17	119.80	28.05	2.80
Sub-total: Heavy Equipment	**20.46**	**18.03**	**468.75**	**2.17**	**119.80**	**28.05**	**2.80**
Commuting Vehicles - Fugitive Dust	18.55	2.77	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	2.08	1.91	8.75	1.73	20.62	5.23	0.52
Sub-total: Commuting Vehicles	**20.63**	**4.68**	**8.75**	**1.73**	**20.62**	**5.23**	**0.52**
Total	**41.08**	**22.72**	**477.50**	**3.91**	**140.42**	**33.28**	**3.33**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-102. Summary of Output – Alternative D (Proposed RMP) Summary of ROWs and Corridors Emissions – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	2.85	0.43	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	1.20	1.20	61.70	2.17	11.88	14.13	1.41
Sub-total: Heavy Equipment	**4.05**	**1.63**	**61.70**	**2.17**	**11.88**	**14.13**	**1.41**
Commuting Vehicles - Fugitive Dust	18.55	2.77	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	2.08	1.91	8.75	1.73	20.62	5.23	0.52
Sub-total: Commuting Vehicles	**20.63**	**4.68**	**8.75**	**1.73**	**20.62**	**5.23**	**0.52**
Total	**24.68**	**6.31**	**70.45**	**3.91**	**32.51**	**19.36**	**1.94**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-103. All Alternatives – OHV Emissions (BLM-Administered Surface)

Emissions (Tons/Year)					
Year	Hydro-carbons (HC)	Carbon Monoxide (CO)	Nitrogen Oxides (NO_x)	Particulate Matter (PM)	HAPs[a]
2000	233.50	668.86	2.99	7.11	23.35
2005	354.14	971.04	4.54	11.35	35.41
2010	456.85	1,220.07	6.39	14.99	45.69
2020	551.81	1,505.53	8.48	18.04	55.18

[a] Hazardous air pollutants; assumed equal to HC * 0.10.

Table J-104. Summary of Output – Alternative A
Total Annual Emissions from Road Maintenance Projects – Year 2001 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Road Maintenance - Fugitive Dust	3.78	0.41	---	---	---	---	---
Road Maintenance - Combustive Emissions[a]	0.02	0.02	0.45	0.01	0.14	0.04	0.00
Total	**3.80**	**0.43**	**0.45**	**0.01**	**0.14**	**0.04**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-105. Summary of Output – Alternative A
Total Annual Emissions from Road Maintenance Projects – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Road Maintenance - Fugitive Dust	3.78	0.41	---	---	---	---	---
Road Maintenance - Combustive Emissions[a]	0.01	0.01	0.22	0.00	0.05	0.02	0.00
Total	**3.79**	**0.41**	**0.22**	**0.00**	**0.05**	**0.02**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-106. Summary of Output – Alternative A
Total Annual Emissions from Road Maintenance Projects – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Road Maintenance - Fugitive Dust	3.78	0.41	---	---	---	---	---
Road Maintenance - Combustive Emissions[a]	0.00	0.00	0.01	0.00	0.00	0.01	0.00
Total	**3.78**	**0.41**	**0.01**	**0.00**	**0.00**	**0.01**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-107. Summary of Output – Alternative B
Total Annual Emissions from Road Maintenance Projects – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	**$PM_{2.5}$**	**NO_x**	**SO_2**	**CO**	**VOC**	**HAPs[b]**
Road Maintenance - Fugitive Dust	3.78	0.41	---	---	---	---	---
Road Maintenance - Combustive Emissions[a]	0.01	0.01	0.22	0.00	0.05	0.02	0.00
Total	**3.79**	**0.41**	**0.22**	**0.00**	**0.05**	**0.02**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-108. Summary of Output – Alternative B
Total Annual Emissions from Road Maintenance Projects – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	**$PM_{2.5}$**	**NO_x**	**SO_2**	**CO**	**VOC**	**HAPs[b]**
Road Maintenance - Fugitive Dust	3.78	0.41	---	---	---	---	---
Road Maintenance - Combustive Emissions[a]	0.00	0.00	0.01	0.00	0.00	0.01	0.00
Total	**3.78**	**0.41**	**0.01**	**0.00**	**0.00**	**0.01**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-109. Summary of Output – Alternative C
Total Annual Emissions from Road Maintenance Projects – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	**$PM_{2.5}$**	**NO_x**	**SO_2**	**CO**	**VOC**	**HAPs[b]**
Road Maintenance - Fugitive Dust	3.78	0.41	---	---	---	---	---
Road Maintenance - Combustive Emissions[a]	0.01	0.01	0.22	0.00	0.05	0.02	0.00
Total	**3.79**	**0.41**	**0.22**	**0.00**	**0.05**	**0.02**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-110. Summary of Output – Alternative C
Total Annual Emissions from Road Maintenance Projects – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Road Maintenance - Fugitive Dust	3.78	0.41	---	---	---	---	---
Road Maintenance - Combustive Emissions[a]	0.00	0.00	0.01	0.00	0.00	0.01	0.00
Total	**3.78**	**0.41**	**0.01**	**0.00**	**0.00**	**0.01**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-111. Summary of Output – Alternative D (Proposed RMP)
Total Annual Emissions from Road Maintenance Projects – Year 2011 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Road Maintenance - Fugitive Dust	3.78	0.41	---	---	---	---	---
Road Maintenance - Combustive Emissions[a]	0.01	0.01	0.22	0.00	0.05	0.02	0.00
Total	**3.79**	**0.41**	**0.22**	**0.00**	**0.05**	**0.02**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-112. Summary of Output – Alternative D (Proposed RMP)
Total Annual Emissions from Road Maintenance Projects – Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Road Maintenance - Fugitive Dust	3.78	0.41	---	---	---	---	---
Road Maintenance - Combustive Emissions[a]	0.00	0.00	0.01	0.00	0.00	0.01	0.00
Total	**3.78**	**0.41**	**0.01**	**0.00**	**0.00**	**0.01**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-113. Summary of Output – Geophysical Exploration Year 2011 and Year 2020 (BLM-Administered Surface)

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[a]
Alternative A – Year 2011 and Year 2020	12.8	12.4	115	9.2	81.2	14.4	---
Alternative B – Year 2011 and Year 2020	---	---	---	---	---	---	---
Alternative C – Year 2011 and Year 2020	12.8	12.4	115	9.2	81.2	14.4	---
Alternative D (Proposed RMP) – Year 2011 and Year 2020	12.8	12.4	115	9.2	81.2	14.4	---

[a] HAPs = Hazardous Air Pollutants

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KEMMERER
PROPOSED RESOURCE MANAGEMENT PLAN AND
FINAL ENVIRONMENTAL IMPACT STATEMENT

Appendix K

Economic Impact Analysis Methodology

Appendix K
Economic Impact Analysis Methodology

This appendix describes the detailed data used in the economic impact modeling analysis. Input-output models such as the Impact Analysis for Planning (IMPLAN) model, an economic impact analysis model, provide a quantitative representation of the production relationships between individual economic sectors. Thus, the economic modeling analysis uses information about physical production quantities and the prices and costs for goods and services. The inputs required to run the IMPLAN model are described in the following narrative and tables. The resulting estimates from the IMPLAN model, by alternative, can be found in the Economic Conditions section in Chapter 4. The first section, below, provides details of how the IMPLAN model was used to estimate economic impacts. The remaining sections provide additional detailed data used in the analysis for oil and gas, coal, livestock grazing, and recreation.

1.0 THE IMPLAN MODEL

IMPLAN is a regional economic model that provides a mathematical accounting of the flow of money, goods, and services through a region's economy. The model provides estimates of how a specific economic activity translates into jobs and income for the region. It includes the ripple effect (also called the "multiplier effect") of changes in economic sectors that may not be directly impacted by management actions, but are linked to industries that are directly impacted. In IMPLAN, these ripple effects are termed indirect impacts (for changes in industries that sell inputs to the industries that are directly impacted) and induced impacts (for changes in household spending as household income increases or decreases due to the changes in production).

The IMPLAN model classifies economic activity into over 500 sectors. This analysis involved direct changes in economic activity across many of these economic sectors, including sectors related to oil and gas production (primarily Natural Gas and Crude Petroleum, Maintenance and Repair of Oil and Gas Wells, and Wholesale Trade, which captures purchases of tangible equipment such as pipe, casing, valves, and meters). (The distribution of expenditures across IMPLAN sectors is based on information from actual expenditures obtained from operators for wells drilled in southwest Wyoming (Taylor 2007)). In addition, the analysis involved direct changes in sectors related to livestock production (Ranch Cattle, and Sheep, Lambs, and Goats) and sectors related to off-highway vehicle (OHV) use and recreation: Hotels and Lodging Places, Eating and Drinking, Amusement and Recreation Services, Food Stores, Service Stations, and Miscellaneous Retail. Based on the relationships between and among sectors in the IMPLAN model, the direct changes in these economic sectors translate into indirect changes in all other related sectors due to the ripple effect.

The IMPLAN production coefficients were modified (calibrated) to reflect the interaction of producing sectors in the three county (Lincoln, Sweetwater, Uinta) study area. As a result, the calibrated model does a better job of generating multipliers and the subsequent impacts that reflect the interaction between and among the sectors in the study area compared to a model using unadjusted national coefficients. Specifically, worker productivity in oil and gas production is higher in Wyoming than nationally, and more of the hay used for livestock feed is produced within the region, compared with national averages. Key variables used in the IMPLAN model were filled in using data specific to Wyoming, including employment estimates, labor earnings, and total industry output (Taylor 2004). Due to price fluctuations, the value of cattle and sheep production was based on the average value from 1993 to 2002, calculated based on data from the Wyoming Agricultural Statistics Service (Taylor 2004). This analysis used IMPLAN 2000; prior to running the model, cost and price data were converted to a consistent dollar year (2000) using regional and sector-specific adjustment factors from the IMPLAN model. The values in this appendix generally are expressed in year 2004 dollars so that the earnings and employment estimates can be easily compared to the latest (i.e., 2004) earnings and employment data available from the Bureau of Economic Analysis.

2.0 OIL AND GAS

The economic impacts analysis for oil and gas reflects drilling, completion, and production activities.

The Minerals – Leasable section in Chapter 4 provides information on the number of oil and gas wells drilled and number of wells completed (i.e., productive wells). Estimated oil and gas production on Bureau of Land Management (BLM)-administered land and mineral estate from 2001 to 2020 in the planning area is shown at the end of this section (Tables K-5 and K-6). The costs of drilling and completing wells and producing oil and gas also are relevant for the economic impact analysis.

The IMPLAN model assumes that workers involved in well drilling and completion in the oil and gas fields spend a portion of their earnings within the planning area. This spending generates additional output, jobs, and earnings in the planning area due to the multiplier effect. However, some oil and gas drilling and completion workers may spend less of their wages in the planning area than is reflected by the IMPLAN model. Due to this uncertainty, the analysis of indirect and induced impacts due to oil and gas drilling and completion reflects two alternative assumptions about the portion of earnings that field workers spend within the planning area. The "high scenario" reflects the default assumption in IMPLAN about how much of their earnings field workers spend in the planning area, while the "low scenario" reflects an assumption that workers involved in oil and gas drilling and completion do not spend any of their income within the planning area.

Table K-1 provides a summary of the assumptions used for the economic analysis relative to the costs of drilling, completion, and production of conventional wells in the Moxa Arch and Overthrust Belt regions, as well as for coalbed natural gas wells.

Table K-1. Assumptions for Analysis of Economic Impacts for Oil and Gas Well Drilling and Completion According to Well Type

Assumption	Conventional Wells		Coalbed Natural Gas Wells
	Moxa Arch	Overthrust Belt	
Drilling Impacts			
Drilling Cost ($/well)	$549,916	$2,429,407	$50,918
Local Drilling Costs[1]	87%	87%	87%
Local Direct Impact ($/well)	$478,427	$2,113,584	$44,299
Local Total Impact ($/well)[2] – High Scenario[3]	$642,964	$2,840,473	$59,533
Multiplier (total impact/direct impact) – High Scenario[3]	1.34	1.34	1.34
Local Total Impact ($/well)[2] – Low Scenario[3]	$604,604	$2,671,006	$55,982
Multiplier (total impact/direct impact) – Low Scenario[3]	1.26	1.26	1.26
Completion Impacts			
Completion Cost ($/well)	$256,125	$1,059,227	$40,980
Local Completion Costs[1]	41%	41%	41%
Local Direct Impact ($/well)	$105,011	$434,283	$16,802
Local Total Impact ($/well)[2] – High Scenario[3]	$137,837	$570,036	$22,054
Multiplier (total impact/direct impact) – High Scenario[3]	1.31	1.31	1.31
Local Total Impact ($/well)[2] – Low Scenario[3]	$132,959	$549,865	$21,273
Multiplier (total impact/direct impact) – Low Scenario[3]	1.27	1.27	1.27

Source: Drilling and completion costs are from BLM 2006a, adjusted from 2003 to 2004 dollars using IMPLAN adjustment factors. Moxa Arch well costs correspond to 9,000-10,000 foot Frontier wells, and Overthrust Belt well costs correspond to a weighted average of 12,000-foot Frontier wells (70%) and 15,000 to 16,000-foot Dakota/Frontier wells (30%). Local drilling and completion costs are calculated using data provided by Taylor (2004).

[1] The local cost shares were based on the percent of total drilling or completion costs that would be spent on goods and services purchased from the local economy.

[2] Total impacts estimated using IMPLAN include direct, indirect, and induced impacts.

[3] As described in the text, the high scenario reflects the default assumption in IMPLAN about how much of their earnings field workers spend in the planning area, while the low scenario reflects an assumption that workers involved in oil and gas drilling and completion do not spend any of their income within the planning area.

The assumptions in Table K-2 were used to determine the values of natural gas and oil production. In addition, the analysis used a figure of $0.89 (year 2000 dollars) per thousand cubic feet (mcf) for gas production costs based on data from the Energy Information Administration (Taylor 2004).

Table K-2. Assumptions for Analysis of Economical Impacts on Output for Oil and Gas Production

Economic Impact	Oil Production (per million barrels)	Gas Production (per billion cubic feet)
Direct Economic Impact[1]	$39,369,760[2]	$5,901,380[3]
Indirect Economic Impact[4]	$3,868,866	$579,929
Induced Economic Impact[5]	$426,060	$63,865
Total Economic Impact	$43,664,686	$6,545,173
Multiplier (total impact/direct impact)	1.11	1.11

Note: All dollar values are in 2004 dollars. Production cost is calculated based on data from the Energy Information Administration, as documented in Taylor (2004).

[1] Direct economic impact is the market value of output.

[2] Based on oil price forecast of $40 per barrel for beyond 2006 (CREG 2006), adjusted to 2004 dollars using IMPLAN adjustment factors.

[3] Based on natural gas price forecast of $6.00 per thousand cubic feet for beyond 2006 (CREG 2006), adjusted to 2004 dollars using IMPLAN adjustment factors.

[4] Indirect impacts from IMPLAN reflect increased demand in sectors that directly or indirectly provide supplies to the oil and gas industry.

[5] Induced impacts from IMPLAN reflect increased demand in the consumer and government sectors.

The forecasted number of wells and production used for estimating employment impacts is the same as for estimating impacts on labor earnings and output. Table K-3 shows the direct and total employment impacts attributable to drilling and completion. Table K-3 also shows two alternative assumptions about where oil and gas drilling and completion workers spend their earnings: the high scenario reflects the default assumption in IMPLAN about how much of their earnings field workers spend in the planning area, while the low scenario reflects an assumption that workers involved in oil and gas drilling and completion do not spend any of their income within the planning area.

Table K-3. Assumptions for Employment Impact Analysis for Oil and Gas Well Drilling and Completion According to Well Type

Employment Impact	Conventional Wells		Coalbed Natural Gas Wells
	Moxa Arch	Overthrust Belt	
Drilling Impacts			
Direct Employment (jobs/well)	3.3	14.7	0.3
Total Employment Impact (jobs/well) – High Scenario[1]	5.3	23.2	0.5
Multiplier (Total Impact/Direct Impact) – High Scenario[1]	1.59	1.59	1.59
Average Earnings per Job (2004 dollars) – High Scenario[1]	$36,107	$36,107	$36,107
Total Employment Impact (jobs/well) – Low Scenario[1]	4.7	20.9	0.4
Multiplier (Total Impact/Direct Impact) – Low Scenario[1]	1.43	1.43	1.43
Average Earnings per Job (2004 dollars) – Low Scenario[1]	$37,758	$37,758	$37,758
Completion Impacts			
Direct Employment (jobs/well)	0.9	3.8	0.1
Total Employment Impact (jobs/well) – High Scenario[1]	1.3	5.5	0.2
Multiplier (Total Impact/Direct Impact) – High Scenario[1]	1.47	1.47	1.47
Average Earnings per Job (2004 dollars) – High Scenario[1]	$34,603	$34,603	$34,603
Total Employment Impact (jobs/well) – Low Scenario[1]	1.3	5.3	0.2
Multiplier (Total Impact/Direct Impact) – Low Scenario[1]	1.39	1.39	1.39
Average Earnings per Job (2004 dollars) – Low Scenario[1]	$35,309	$35,309	$35,309

Note: Direct and total employment impact and average earnings per job are calculated using IMPLAN.

[1] As described in the text, the high scenario reflects the default assumption in IMPLAN about how much of their earnings field workers spend in the planning area, while the low scenario reflects an assumption that workers involved in oil and gas drilling and completion do not spend any of their income within the planning area.

Table K-4 shows the direct and total employment impacts associated with production.

Table K-4. Assumptions for Employment Impacts Analysis for Oil and Gas Production

Employment Impact (annual number of jobs)	Oil Production (per million barrels)	Gas Production (per billion cubic feet)
Direct Employment	3.9	0.6
Indirect Employment	19.3	2.9
Induced Employment	7.7	1.2
Total Employment	30.8	4.6
Multiplier (Total Impact/Direct Impact)	8.0	8.0
Average Earnings per Job (2004 dollars)	$40,238	$40,238

Note: Direct, indirect, and induced employment impact and average earnings per job are calculated using IMPLAN.

The analysis of potential changes in tax revenues is based on tax rates of 12.5 percent of taxable value for federal mineral royalties, 6 percent of taxable value for state severance taxes (WY DOR 2001), and 6.3 percent of taxable value for local ad valorem production taxes (based on averaging local mineral tax rates for Lincoln, Sweetwater, and Uinta Counties from WY DOR (2006), and reported in the Economic Conditions section of Chapter 3. Taxable value refers to value of sales minus allowable deductions, including certain costs of production and transportation. For analysis purposes, taxable value was estimated based on the average taxable value per unit sold from the three counties in the planning area for July 2005 through June 2006 using data from WY DOR (2006). Taxable value was estimated as $49.02 per barrel for oil, and $5.09 per mcf for natural gas (2004 dollars).

Table K-5 shows estimated gas production, and Table K-6 shows estimated oil production, on Bureau of Land Management (BLM)-administered land and mineral estate from 2001 to 2020 in the planning area, which was used as an input for the IMPLAN analysis of oil and gas production.

Table K-5. Estimated Federal Gas Production in the Planning Area (billions of cubic feet)

Year	Alternative A	Alternative B	Alternative C	Alternative D (Proposed RMP)
2001	3.56	2.58	3.56	3.56
2002	4.29	2.79	4.29	4.29
2003	11.51	6.49	11.51	11.51
2004	17.68	9.78	17.78	17.61
2005	23.85	12.94	24.01	23.69
2006	29.20	15.88	29.29	28.99
2007	34.26	18.45	34.39	33.96
2008	38.99	20.95	39.17	38.61
2009	43.64	23.28	43.85	43.17
2010	47.68	25.42	47.79	47.32
2011	51.70	27.40	51.82	51.24
2012	55.15	29.22	55.34	54.64
2013	58.58	30.90	58.82	58.02
2014	61.50	32.45	61.63	60.88
2015	64.45	33.88	64.61	63.78
2016	66.93	35.19	67.01	66.25
2017	69.47	36.41	69.60	68.74
2018	71.54	37.53	71.58	70.95
2019	73.40	38.56	73.64	73.06
2020	75.19	39.51	75.38	74.79
Total	902.59	479.61	905.07	895.05

Source: BLM 2006b.

Table K-6. Estimated Federal Oil Production in the Planning Area (millions of barrels)

Year	Alternative A	Alternative B	Alternative C	Alternative D (Proposed RMP)
2001	0.07	0.07	0.07	0.07
2002	0.07	0.07	0.07	0.07
2003	0.19	0.15	0.19	0.19
2004	0.29	0.21	0.29	0.29
2005	0.38	0.26	0.38	0.37
2006	0.44	0.30	0.44	0.44
2007	0.51	0.33	0.51	0.50
2008	0.56	0.36	0.56	0.55
2009	0.60	0.38	0.61	0.60
2010	0.64	0.41	0.64	0.63
2011	0.67	0.42	0.68	0.67
2012	0.70	0.44	0.70	0.69
2013	0.72	0.45	0.73	0.72
2014	0.74	0.46	0.74	0.73
2015	0.76	0.47	0.76	0.75
2016	0.77	0.48	0.77	0.76
2017	0.79	0.49	0.79	0.78
2018	0.79	0.49	0.80	0.79
2019	0.80	0.50	0.81	0.80
2020	0.81	0.50	0.81	0.80
Total	11.29	7.24	11.35	11.22

Source: BLM 2006b.

3.0 LIVESTOCK GRAZING

Economic impacts due to changes in livestock grazing are a function of the amount of forage available and the economic value of the forage. For livestock grazing, long-term surface-disturbing actions from actions listed in Appendix M could affect the authorized animal unit months (AUMs). In addition, land disposal actions could have economic impacts; however, those impacts were not analyzed quantitatively because it is difficult to predict the net change in AUMs. Subsequent landowners may continue to graze the land, leaving overall livestock production and output in the region unaffected.

Table K-7 provides a summary, according to alternatives, of initial AUMs and total AUMs lost by 2020 due to surface-disturbing activities. Based on current allocations of AUMs to cattle and sheep (BLM 2003), 62 percent of the AUM reduction is allocated to cattle and 38 percent to sheep, for the purpose of estimating changes in output and employment.[1] The base number of AUMs available is 157,249 (Netherly 2004). Surface-disturbance acres were converted to AUMs using a conversion factor of 9.3 acres per AUM (Netherly 2004).

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[1] In some years, actual use of grazing leases may be less than 100 percent of authorized use. If surface disturbance impacts land that is authorized for grazing, but not actually used in a given year, then no economic impacts would result from the loss of that grazing land.

Table K-7. Estimated Animal Unit Month Losses

Item	Alternative A	Alternative B	Alternative C	Alternative D (Proposed RMP)
Initial AUMs	157,249	157,249	157,249	157,249
AUMs lost from surface-disturbing activities (total)	15,556	5,079	15,534	8,338
Incremental AUMs lost from surface-disturbing activities (per year)	778	254	777	417
Net AUMs in 2020	141,693	152,170	141,715	148,911

Note: Acres are converted to AUMs using a conversion factor of 9.3 acres per AUM (Netherly 2004).

Due to price fluctuations, average per-AUM values for cattle and sheep are based on the 1993 to 2002 average value of production estimates from the Wyoming Agricultural Statistics Service (Taylor 2004). The value for cattle is $36.91 per AUM and the value for sheep is $23.97 per AUM (in 2004 dollars). Including indirect and induced impacts, the value of one AUM for cattle is $64.71 and for sheep $41.08 (in 2004 dollars). Table K-8 shows the economic impact assumptions for cattle and sheep. The direct economic impact is the estimated change in livestock output per AUM; IMPLAN generates the indirect and induced impacts.

Table K-8. Assumptions for Analysis of Impacts on Output for Livestock Grazing

Economic Impact	Cattle	Sheep
Direct Economic Impact ($/AUM)[1]	$36.91	$23.97
Indirect Economic Impact ($/AUM)[2]	$20.99	$12.74
Induced Economic Impact ($/AUM)[3]	$6.81	$4.37
Total Economic Impact ($/AUM)	$64.71	$41.08
Multiplier (Total Impact/Direct Impact)	1.75	1.71

Note: All dollar values are in 2004 dollars.

[1] Direct economic impact is the market value of output, based on data for 1993-2002 from Wyoming Agricultural Statistics Service (Taylor 2004).

[2] Indirect impacts reflect increased demand in sectors that directly or indirectly provide supplies to the livestock industry.

[3] Induced impacts reflect increased demand in the consumer and government sectors.

AUM Animal Unit Month

Table K-9 provides a summary of the employment impacts assumed according to unit changes in livestock AUMs.

Table K-9. Assumptions for Analysis of Employment Impacts for Livestock Grazing

Employment Impact	Cattle	Sheep
Direct Employment (Jobs/1,000 AUMs)	0.307	0.700
Indirect Employment (Jobs/1,000 AUMs)	0.335	0.252
Induced Employment (Jobs/1,000 AUMs)	0.106	0.069
Total Employment (Jobs/1,000 AUMs)	0.747	1.021
Multiplier (Total Impact/Direct Impact)	2.44	1.46
Average Earnings per Job (2004 dollars)	$26,626	$12,341

Note: Direct, indirect, and induced employment impacts and average earnings per job are calculated using IMPLAN.

4.0 RECREATION

The analysis of economic impacts considers only recreation expenditures of nonresidents of the three-county study area. This is based on the assumption that expenditures of residents would occur in the region regardless of the BLM's actions that impact recreational opportunities; however, changes in nonresident recreation patterns would alter the amount of money entering the local region.

Economic impacts from recreation are a function of recreation visitor days (RVDs) and expenditures per day. Future RVDs were estimated based on current RVDs and estimated growth rates, both of which were provided by BLM (Mierzejewski 2006). These estimates of current and future RVDs were based on multiple sources, including a U.S. Forest Service (USFS) study that provides forecasts of recreation activity for the Rocky Mountain region (Bowker et al. 1999), contacts with neighboring BLM field offices, and the professional judgment of BLM staff (Mierzejewski 2006). Nonresident RVDs in 2003 on BLM land were estimated at 5,145 for OHV; 26,478 for hunting; 18,377 for fishing; and 7,130 for other nonconsumptive recreation (including heritage tourism, hiking, viewing wildlife, biking and horseback riding) (Mierzejewski 2006). Table K-10 provides a summary of estimated annual growth rates by alternative.

Table K-10. Estimated Annual Growth Rates for Nonresident Recreation Visitor Days

Recreation Activity	Alternative A	Alternative B	Alternative C	Alternative D (Proposed RMP)
OHV	1.54%	1.20%	1.50%	2.00%
Hunting	1.10%	1.10%	1.10%	1.10%
Fishing	1.28%	1.28%	1.28%	1.28%
Other Nonconsumptive	1.30%	1.30%	1.30%	1.30%

Source: Mierzejewski 2006

OHV Off-highway vehicle

The estimates for average expenditure per visitor day are $94.03 for fishing in 2002 dollars (WGFD 2003); $179.63 for hunting in 2002 dollars (Burkett 2004); $51.55 for wildlife watching in 2001 dollars (USFWS 2003; expenditures excluding equipment costs); and $130.60 for OHV use in 2000 dollars (Colorado OHV Coalition 2001). Table K-11 shows the direct, indirect, and induced output per RVD for each recreation activity, adjusted to 2004 dollars using adjustment factors from IMPLAN.

Table K-11. Assumptions for Analysis of Impacts on Output for Recreation Activities

Economic Impact	OHV (per RVD)	Hunting (per RVD)	Fishing (per RVD)	Other (per RVD)
Direct Economic Impact[1]	$143.79	$188.03	$98.28	$55.04
Indirect Economic Impact[2]	$22.76	$27.64	$10.89	$6.41
Induced Economic Impact[3]	$15.16	$25.11	$10.64	$5.36
Total Economic Impact	$181.70	$240.78	$119.81	$66.81
Multiplier (total impact/direct impact)	1.26	1.28	1.22	1.21

Note: Detail may not add to total due to rounding. All dollar values are in 2004 dollars.

[1] Direct economic impact is the average expenditure per visitor day.

[2] Indirect impacts from IMPLAN reflect increased demand in sectors that directly or indirectly provide support for the recreation industry.

[3] Induced impacts from IMPLAN reflect increased demand in the consumer and government sectors.

IMPLAN	Impact Analysis for Planning
OHV	Off-highway vehicle
RVD	Recreation visitor day

Table K-12 provides a summary of employment impacts assumed according to unit changes in RVDs.

Table K-12. Assumptions for Employment Impacts Analysis for Recreation Activities

Employment Impact (annual number of jobs)	OHV (per 1,000 RVDs)	Hunting (per 1,000 RVDS)	Fishing (per 1,000 RVDS)	Other (per 1,000 RVDS)
Direct Employment	2.5	5.2	1.7	0.8
Indirect Employment	0.3	0.4	0.1	0.1
Induced Employment	0.2	0.4	0.2	0.1
Total Employment	3.1	5.9	2.0	1.0
Multiplier (Total Impact/Direct Impact)	1.22	1.14	1.17	1.21
Average Earnings per Job (2004 dollars)	$15,152	$12,950	$16,100	$16,125

Note: Direct, indirect, and induced employment impact and average earnings per job are calculated using IMPLAN.

IMPLAN	Impact Analysis for Planning
OHV	Off-highway vehicle
RVD	Recreation visitor day

5.0 REFERENCES

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Appendix L

Air Quality Mitigation Matrix

Appendix L
Air Quality Mitigation Matrix

The following table outlines options for air quality mitigation in the planning area.

Table L-1. Potential Mitigation Measures for Air Quality Impacts Associated with the Proposed Kemmerer Resource Management Plan Revision

Type of Mitigation	Estimated Cost of Mitigation	Environmental Liabilities	Environmental Benefit	Potential Limitations
Nitrogen Oxide (NO_X) and Carbon Monoxide (CO) Mitigation Measures				
Utilize selective catalytic reduction (SCR) on drill rig engines and compressors.	Relatively expensive as compared to nonselective catalysts. Typical costs are $125/hp (EPA Cost Control Manual, January 2002) for compressors.	Requires the use and storage of ammonia, which presents health and safety issues. Results in increased ammonia emissions, which may contribute to the formation of ammonium sulfates and increased visibility degradation.	NO_X emission rate for compressors reduced to 0.1 g/hp-hr; reduced ammonium nitrate formation and resulting visibility impacts. Application to drill rig engines may result in substantial NO_x reduction.	Not applicable for 2-stroke engines.
Application of nonselective catalytic reduction on drill rig engines and compressors	$5,000 to $25,000 per unit	Regeneration/disposal costs for catalysts.	As a result of the BACT process, average NO_X emission rates for Wyoming compressor engines 100 hp or greater is 1.0 g/hp-hr; the application of nonselective catalysts may reduce the NO_X emission rate to 0.7 g/hp-hr for some types of engines. Application to drill rig engines may result in substantial NO_x reduction (although less reduction than with SCR).	Not applicable for lean-burn or 2-stroke engines.

Table L-1. Potential Mitigation Measures for Air Quality Impacts Associated with the Proposed Kemmerer Resource Management Plan Revision (Continued)

Type of Mitigation	Estimated Cost of Mitigation	Environmental Liabilities	Environmental Benefit	Potential Limitations
Nitrogen Oxide (NO_X) and Carbon Monoxide (CO) Mitigation Measures (Continued)				
Utilize compressors driven by electrical motors.	Capital costs equal 40% of gas turbine costs; operating cost dependent on the location of high voltage powerlines.	Displaced air emissions from compressor units to electric generating stations (EGS).	May displace air emissions away from sensitive Class I areas; moderate emission reduction near compressor station. Also, typically emissions at an EGS are more heavily controlled than at individual compressor stations, so the displaced emissions are also lower than if emitted by a compressor station.	Requires high voltage power lines.
Increased diameter of sales pipelines	With larger diameter of sales pipelines, capital costs increase while operating costs decrease.	Slightly more surface disturbance.	Lower pipeline pressures, resulting in lower compression hp requirements.	None
Centralization of dehydrator units	Variable		Minor reduction in emissions.	Requires infrastructure to be feasible.
Reduce number of vehicle miles driven and unnecessary idling.	Minor		Minor to moderate emissions reduction.	
Utilize wind-generated electricity to power compressors.	Capital costs are very large.	Visual impacts from generation equipment; increased mortality of birds, including raptors.	Reduced use of fossil fuels and associated emissions.	Location of wind-generation facilities is critical; requires consistent strong winds for economic operation and high voltage transmission lines between generation facility and compressor stations.

Table L-1. Potential Mitigation Measures for Air Quality Impacts Associated with the Proposed Kemmerer Resource Management Plan Revision (Continued)

Type of Mitigation	Estimated Cost of Mitigation	Environmental Liabilities	Environmental Benefit	Potential Limitations
Nitrogen Oxide (NO_X) and Carbon Monoxide (CO) Mitigation Measures (Continued)				
Increased emissions monitoring	Minor to moderate	None	Allows better planning of when, and especially where to allow future emissions to occur and when/where to provide for additional emissions mitigation. The Wyoming DEQ AQD currently has an emission tracking agreement with the BLM. The *Amended Letter of Agreement for Tracking Nitrogen Oxide Emissions* dated April 2000 calls for annual reports tracking changes in NO_X emission beginning January 1, 1996.	The monitoring of emission sources provides improved information for estimating impacts, but does not necessarily reduce the magnitude of the impacts.
Increased ambient pollutant monitoring	Moderate	None	Will measure impacts from pollutant sources of concern if correctly located.	
Reduced rate of development	Short-term loss of state and federal royalties.	Emissions generated at a lower rate for a longer period.	Peak emissions and associated impacts reduced.	Economic limitations - A minimum production rate is required to cost-effectively develop the resource while maintaining the processing and transportation infrastructure.

Table L-1. Potential Mitigation Measures for Air Quality Impacts Associated with the Proposed Kemmerer Resource Management Plan Revision (Continued)

Type of Mitigation	Estimated Cost of Mitigation	Environmental Liabilities	Environmental Benefit	Potential Limitations
Particulate Matter (PM) Mitigation Measures				
Increase water application rate to achieve greater than 50% fugitive dust control.	Varies with the source of the water and the trucking distance.	None	Can achieve fugitive dust control rates up to 95%	Diminishing returns per gallon of water applied; water must be applied at much greater rates to achieve control efficiencies greater than 75%
Unpaved road dust suppressant treatments	$2,400 to $50,000 per mile	Treatment chemicals have the potential to negatively impact water quality.	Estimated 20% to 100% reduction in fugitive dust emissions.	None
Administrative control of speed limits	Relatively low costs for installing signs and enforcement.	None	Slower speeds may provide 20% to 50% reduction in dust emissions.	State or county may retain authority for determining speed limits on primary roads.
Installation of remote telemetry	Approximately $13,000 per well	None	Reduction in vehicle miles traveled and associated vehicle emissions during production operations; no benefit for construction operations, which generate the greatest amount of PM.	Effective only for the production phase of the operations; would have no impact on construction activities that generate the greatest amount of PM.
Gravel roads	Approximately $9,000 per mile	None	Estimated 30% reduction in fugitive road dust (NOTE: use of additional low-impact road design specifications [e.g., 95% base compaction prior to placement of gravel; use of non-chlorine based dust abatement chemicals] can provide greater reduction).	None
Paved roads	Approximately $11,000 to $60,000 per mile	None	Estimated 90% reduction in fugitive road dust.	None

Table L-1. Potential Mitigation Measures for Air Quality Impacts Associated with the Proposed Kemmerer Resource Management Plan Revision (Continued)

Type of Mitigation	Estimated Cost of Mitigation	Environmental Liabilities	Environmental Benefit	Potential Limitations
Volatile Organic Compounds (VOCs) and Hazardous Air Pollutants (HAPs) Mitigation Measures				
Flareless ("green") completion	Substantial cost for equipment and infrastructure (condensate pipeline), with the payoff in about one year at $3/Mcf.		Minor reduction in emissions; substantial reduction in noise and night-time disturbance.	Requires infrastructure to be feasible.
Condensate tank vents, carbon canisters or other VOC capture to the vent discharge	Minor costs		Minor emission reduction	

AQD	Air Quality Division	HAP	hazardous air pollutants
BACT	best available control technology	hp	horsepower
CO	carbon monoxide	hr.	hour
DEQ	Department of Environmental Quality	NO_x	nitrogen oxides
EPA	U.S. Environmental Protection Agency	PM	particulate matter
g	gram	VOC	volatile organic compound

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Appendix M

Surface Disturbance and Reasonable Foreseeable Actions

Table M-1. Surface Disturbance from Reasonable Foreseeable Actions

Type of Disturbance	Alternative A	Alternative B	Alternative C	Alternative D (Proposed RMP)
Fire and Fuels Management				
Management Ignited Prescribed Fire				
Acres Short-Term Disturbance from BLM Actions	40,000	40,000	0	40,000
Acres Reclaimed from BLM Actions	39,600	39,600	0	39,600
Acres Long-Term Disturbance from BLM Actions	400	400	0	400
Acres Short-Term Disturbance from Non-BLM Actions	1,500	1,500	1,500	1,500
Acres Reclaimed from Non-BLM Actions	1,350	1,350	1,350	1,350
Acres Long-Term Disturbance from Non-BLM Actions	150	150	150	150
Fuels Management - Mechanical Treatments (Hand Work)				
Acres Short-Term Disturbance from BLM Actions	2,000	2,000	0	2,000
Acres Reclaimed from BLM Actions	2,000	2,000	0	2,000
Acres Long-Term Disturbance from BLM Actions	0	0	0	0
Acres Short-Term Disturbance from Non-BLM Actions	1,000	1,000	1,000	1,000
Acres Reclaimed from Non-BLM Actions	1,000	1,000	1,000	1,000
Acres Long-Term Disturbance from Non-BLM Actions	0	0	0	0
Forest and Woodlands				
Silviculture Treatments, Forest Products, and Insect Control				
Acres Short-Term Disturbance from BLM Actions	2,500	2,000	5,000	3,000
Acres Reclaimed from BLM Actions	2,500	2,000	5,000	3,000
Acres Long-Term Disturbance from BLM Actions	0	0	0	0
Acres Short-Term Disturbance from Non-BLM Actions	8,000	8,000	8,000	8,000
Acres Reclaimed from Non-BLM Actions	8,000	8,000	8,000	8,000
Acres Long-Term Disturbance from Non-BLM Actions	0	0	0	0

Table M-1. Surface Disturbance from Reasonable Foreseeable Actions *(Continued)*

Type of Disturbance	Alternative A	Alternative B	Alternative C	Alternative D (Proposed RMP)
Livestock Grazing				
Spring Development				
Acres Short-Term Disturbance from BLM Actions	125	125	125	125
Acres Reclaimed from BLM Actions	125	125	125	125
Acres Long-Term Disturbance from BLM Actions	0	0	0	0
Acres Short-Term Disturbance from Non-BLM Actions	75	75	75	75
Acres Reclaimed from Non-BLM Actions	75	75	75	75
Acres Long-Term Disturbance from Non-BLM Actions	0	0	0	0
Pipeline Development				
Acres Short-Term Disturbance from BLM Actions	150	150	150	150
Acres Reclaimed from BLM Actions	150	150	150	150
Acres Long-Term Disturbance from BLM Actions	0	0	0	0
Acres Short-Term Disturbance from Non-BLM Actions	150	150	150	150
Acres Reclaimed from Non-BLM Actions	150	150	150	150
Acres Long-Term Disturbance from Non-BLM Actions	0	0	0	0
Fence Development				
Acres Short-Term Disturbance from BLM Actions	600	600	600	600
Acres Reclaimed from BLM Actions	600	600	600	600
Acres Long-Term Disturbance from BLM Actions	0	0	0	0
Acres Short-Term Disturbance from Non-BLM Actions	600	600	600	600
Acres Reclaimed from Non-BLM Actions	600	600	600	600
Acres Long-Term Disturbance from Non-BLM Actions	0	0	0	0

Table M-1. Surface Disturbance from Reasonable Foreseeable Actions *(Continued)*

Type of Disturbance	Alternative A	Alternative B	Alternative C	Alternative D (Proposed RMP)
Well Development				
Acres Short-Term Disturbance from BLM Actions	30	30	30	30
Acres Reclaimed from BLM Actions	30	30	30	30
Acres Long-Term Disturbance from BLM Actions	0	0	0	0
Acres Short-Term Disturbance from Non-BLM Actions	60	60	60	60
Acres Reclaimed from Non-BLM Actions	60	60	60	60
Acres Long-Term Disturbance from Non-BLM Actions	0	0	0	0
Reservoir Maintenance				
Acres Short-Term Disturbance from BLM Actions	29	29	29	29
Acres Reclaimed from BLM Actions	5	5	5	5
Acres Long-Term Disturbance from BLM Actions	24	24	24	24
Acres Short-Term Disturbance from Non-BLM Actions	19	19	19	19
Acres Reclaimed from Non-BLM Actions	3	3	3	3
Acres Long-Term Disturbance from Non-BLM Actions	16	16	16	16
Mineral Resources – Locatable				
Acres Short-Term Disturbance from BLM Actions	700	370	700	370
Acres Reclaimed from BLM Actions	525	280	525	280
Acres Long-Term Disturbance from BLM Actions	175	90	175	90
Acres Short-Term Disturbance from Non-BLM Actions	100	100	100	100
Acres Reclaimed from Non-BLM Actions	75	75	75	75
Acres Long-Term Disturbance from Non-BLM Actions	25	25	25	25

Table M-1. Surface Disturbance from Reasonable Foreseeable Actions *(Continued)*

Type of Disturbance	Alternative A	Alternative B	Alternative C	Alternative D (Proposed RMP)
Mineral Resources – Coal				
Acres Short-Term Disturbance from BLM Actions	500	500	800	800
Acres Reclaimed from BLM Actions	250	250	400	400
Acres Long-Term Disturbance from BLM Actions	250	250	400	400
Acres Short-Term Disturbance from Non-BLM Actions	250	250	650	650
Acres Reclaimed from Non-BLM Actions	125	125	325	325
Acres Long-Term Disturbance from Non-BLM Actions	125	125	325	325
Mineral Resources – Oil and Gas				
Acres Short-Term Disturbance from BLM Actions	11,371	4,863	11,418	11,243
Acres Reclaimed from BLM Actions	8,352	3,836	8,355	8,221
Acres Long-Term Disturbance from BLM Actions	3,019	1,027	3,063	3,022
Acres Short-Term Disturbance from Non-BLM Actions	15,495	15,495	15,495	15,495
Acres Reclaimed from Non-BLM Actions	9,410	9,410	9,410	9,410
Acres Long-Term Disturbance from Non-BLM Actions	6,085	6,085	6,085	6,085
Mineral Resources – Other Solid Leasables				
Acres Short-Term Disturbance from BLM Actions	300	200	300	300
Acres Reclaimed from BLM Actions	225	150	225	225
Acres Long-Term Disturbance from BLM Actions	75	50	75	75
Acres Short-Term Disturbance from Non-BLM Actions	300	300	300	300
Acres Reclaimed from Non-BLM Actions	225	225	225	225
Acres Long-Term Disturbance from Non-BLM Actions	75	75	75	75

Table M-1. Surface Disturbance from Reasonable Foreseeable Actions *(Continued)*

Type of Disturbance	Alternative A	Alternative B	Alternative C	Alternative D (Proposed RMP)
Mineral Resources – Salables				
Acres Short-Term Disturbance from BLM Actions	1,500	1,400	1,500	1,500
Acres Reclaimed from BLM Actions	150	75	150	150
Acres Long-Term Disturbance from BLM Actions	1,350	1,325	1,350	1,350
Acres Short-Term Disturbance from Non-BLM Actions	600	600	600	600
Acres Reclaimed at Non-BLM Actions	450	450	450	450
Acres Long-Term Disturbance from Non-BLM Actions	150	150	150	150
Off-Highway Vehicles				
Acres Short-Term Disturbance from BLM Actions	1,000	0	1,000	1,000
Acres Reclaimed from BLM Actions	0	0	0	0
Acres Long-Term Disturbance from BLM Actions	1,000	0	1,000	1,000
Acres Short-Term Disturbance from Non-BLM Actions	1,000	1,000	1,000	1,000
Acres Reclaimed from Non-BLM Actions	0	0	0	0
Acres Long-Term Disturbance from Non-BLM Actions	1,000	1,000	1,000	1,000
Recreation				
Acres Short-Term Disturbance from BLM Actions	60	40	60	60
Acres Reclaimed from BLM Actions	10	10	10	10
Acres Long-Term Disturbance from BLM Actions	50	30	50	50
Acres Short-Term Disturbance from Non-BLM Actions	70	70	70	70
Acres Reclaimed from Non-BLM Actions	20	20	20	20
Acres Long-Term Disturbance from Non-BLM Actions	50	50	50	50

Table M-1. Surface Disturbance from Reasonable Foreseeable Actions *(Continued)*

Type of Disturbance	Alternative A	Alternative B	Alternative C	Alternative D (Proposed RMP)
Renewable Energy – Wind Energy Development				
Acres of Short-Term Disturbance from BLM Actions	134,400	40,320	134,400	67,200
Acres Reclaimed from BLM Actions	0	0	0	0
Acres of Long-Term Disturbance from BLM Actions	134,400	40,320	134,400	67,200
Acres of Short-Term Disturbance from Non-BLM Actions	141,360	141,360	141,360	141,360
Acres Reclaimed from Non-BLM Actions	0	0	0	0
Acres of Long-Term Disturbance from Non-BLM Actions	141,360	141,360	141,360	141,360
Rights-of-Way				
Telephone and Fiber Optics				
Acres of Short-Term Disturbance from BLM Actions	1,371	1,371	1,371	1,371
Acres Reclaimed from BLM Actions	1,371	1,371	1,371	1,371
Acres of Long-Term Disturbance from BLM Actions	0	0	0	0
Acres of Short-Term Disturbance from Non-BLM Actions	5	5	5	5
Acres Reclaimed from Non-BLM Actions	5	5	5	5
Acres of Long-Term Disturbance from Non-BLM Actions	0	0	0	0
Pipelines (Large-capacity [10"-36"])				
Acres of Short-Term Disturbance from BLM Actions	6,000	6,000	6,000	6,000
Acres Reclaimed from BLM Actions	6,000	6,000	6,000	6,000
Acres of Long-Term Disturbance from BLM Actions	0	0	0	0
Acres of Short-Term Disturbance from Non-BLM Actions	0	0	0	0
Acres Reclaimed from Non-BLM Actions	0	0	0	0
Acres of Long-Term Disturbance from Non-BLM Actions	0	0	0	0

Table M-1. Surface Disturbance from Reasonable Foreseeable Actions *(Continued)*

Type of Disturbance	Alternative A	Alternative B	Alternative C	Alternative D (Proposed RMP)
Pipelines (Water)				
Acres of Short-Term Disturbance from BLM Actions	60	60	60	60
Acres Reclaimed from BLM Actions	60	60	60	60
Acres of Long-Term Disturbance from BLM Actions	0	0	0	0
Acres of Short-Term Disturbance from Non-BLM Actions	5	5	5	5
Acres Reclaimed from Non-BLM Actions	5	5	5	5
Acres of Long-Term Disturbance from Non-BLM Actions	0	0	0	0
Roads				
Acres of Short-Term Disturbance from BLM Actions	2,256	2,112	2,256	2,256
Acres Reclaimed from BLM Actions	550	550	550	550
Acres of Long-Term Disturbance from BLM Actions	1,706	1,562	1,706	1,706
Acres of Short-Term Disturbance from Non-BLM Actions	1,892	1,892	1,892	1,892
Acres Reclaimed from Non-BLM Actions	550	550	550	550
Acres of Long-Term Disturbance from Non-BLM Actions	1,342	1,342	1,342	1,342
Powerlines				
Acres of Short-Term Disturbance from BLM Actions	1,740	1,740	1,740	1,740
Acres Reclaimed from BLM Actions	8	8	8	8
Acres of Long-Term Disturbance from BLM Actions	1,732	1732	1,732	1,732
Acres of Short-Term Disturbance from Non-BLM Actions	5	5	5	5
Acres Reclaimed from Non-BLM Actions	5	5	5	5
Acres of Long-Term Disturbance from Non-BLM Actions	0	0	0	0

Table M-1. Surface Disturbance from Reasonable Foreseeable Actions *(Continued)*

Type of Disturbance	Alternative A	Alternative B	Alternative C	Alternative D (Proposed RMP)
Communication Sites				
Acres of Short-Term Disturbance from BLM Actions	28	28	28	28
Acres Reclaimed from BLM Actions	6	6	6	6
Acres of Long-Term Disturbance from BLM Actions	22	22	22	22
Acres of Short-Term Disturbance from Non-BLM Actions	42	42	42	42
Acres Reclaimed from Non-BLM Actions	10	10	10	10
Acres of Long-Term Disturbance from Non-BLM Actions	32	32	32	32
Other Facilities				
Acres of Short-Term Disturbance from BLM Actions	365	365	365	365
Acres Reclaimed from BLM Actions	0	0	0	0
Acres of Long-Term Disturbance from BLM Actions	365	365	365	365
Acres of Short-Term Disturbance from Non-BLM Actions	365	365	365	365
Acres Reclaimed from Non-BLM Actions	0	0	0	0
Acres of Long-Term Disturbance from Non-BLM Actions	365	365	365	365
Travel Management				
Road Maintenance				
Acres of Short-Term Disturbance from BLM Actions	35	35	35	35
Acres Reclaimed from BLM Actions	0	0	0	0
Acres of Long-Term Disturbance from BLM Actions	35	35	35	35
Acres of Short-Term Disturbance from Non-BLM Actions	105	105	105	105
Acres Reclaimed from Non-BLM Actions	0	0	0	0
Acres of Long-Term Disturbance from Non-BLM Actions	105	105	105	105

Table M-1. Surface Disturbance from Reasonable Foreseeable Actions *(Continued)*

Type of Disturbance	Alternative A	Alternative B	Alternative C	Alternative D (Proposed RMP)
Vegetation – Chemical Treatments				
Acres of Short-Term Disturbance from BLM Actions	5,000	0	5,000	5,000
Acres Reclaimed from BLM Actions (see note below)	4,950	0	4,950	4,950
Acres of Long-Term Disturbance from BLM Actions	50	0	50	50
Acres of Short-Term Disturbance from Non-BLM Actions	7,500	7,500	7,500	7,500
Acres Reclaimed from Non-BLM Actions	6,000	6,000	6,000	6,000
Acres of Long-Term Disturbance from Non-BLM Actions	1,500	1,500	1,500	1,500
Vegetation – Mechanical Treatments (Excluding Hand Work)				
Acres of Short-Term Disturbance from BLM Actions	2,000	0	2,000	2,000
Acres Reclaimed from BLM Actions (see note below)	1,980	0	1,980	1,980
Acres of Long-Term Disturbance from BLM Actions	20	0	20	20
Acres of Short-Term Disturbance from Non-BLM Actions	5,000	5,000	5,000	5,000
Acres Reclaimed from Non-BLM Actions	4,500	4,500	4,500	4,500
Acres of Long-Term Disturbance from Non-BLM Actions	500	500	500	500
Cumulative Disturbance				
Total Acres Short-Term Disturbance from BLM Actions	214,120	104,338	174,967	147,262
Total Acres Reclaimed from BLM Actions	69,447	57,106	30,500	69,721
Total Acres Long-Term Disturbance from BLM Actions	144,673	47,232	144,467	77,541
Total Acres Short-Term Disturbance from Non-BLM Actions	185,498	185,498	185,898	185,898
Total Acres Reclaimed from Non-BLM Actions	32,618	32,618	32,818	32,818
Total Acres Long-Term Disturbance from Non-BLM Actions	152,880	152,880	153,080	153,080
Cumulative Long-Term Acres of Disturbance	**297,553**	**200,112**	**297,547**	**230,621**

BLM Bureau of Land Management

Table M-2. Reasonable Foreseeable Development for Oil and Gas

Type of Development	Alternative A	Alternative B	Alternative C	Alternative D (Proposed RMP)
Mineral Resources – Oil and Gas Federal Well Projections				
Existing Productive Federal Wells				
Number of Existing Federal Wells	596	596	596	596
Projected Number of Abandoned Existing Federal Wells	134	134	134	134
Remaining Number of Existing Productive Federal Wells	**462**	**462**	**462**	**462**
Projected New Federal Wells				
Number of Projected New Federal Wells	1,012	503	1,020	1,010
Projected Number of Abandoned New Federal Wells	146	74	156	152
Projected Productive New Federal Wells	**866**	**429**	**864**	**858**
Projected Total Productive Federal Wells				
Remaining Number of Existing Productive Federal Wells	462	462	462	462
Projected Productive New Federal Wells	866	429	864	858
Total Number Productive Federal Wells	**1,328**	**891**	**1,326**	**1,320**
Nonfederal Well Projections (State and Fee Minerals)				
Existing Productive Nonfederal Wells				
Number of Existing Nonfederal Wells	759	759	759	759
Projected Number of Abandoned Nonfederal Wells	154	154	154	154
Remaining Number of Existing Productive Nonfederal Wells	**605**	**605**	**605**	**605**
Projected New Nonfederal Wells				
Number of Projected New Nonfederal Wells	1,459	1,459	1,459	1,459
Projected Number of Abandoned New Nonfederal Wells	216	216	216	216
Projected Productive New Nonfederal Wells	**1,243**	**1,243**	**1,243**	**1,243**

Note: Numbers in this table differ from those in Table J-5 for two reasons: (a) existing wells in this table are for year 2000, whereas in Table J-5, existing wells are for year 2001; (b) rounding creates minor differences (one to two wells over the 20-year planning period).

Table M-2. Reasonable Foreseeable Development for Oil and Gas *(Continued)*

Type of Development	Alternative A	Alternative B	Alternative C	Alternative D (Proposed RMP)
Mineral Resources – Oil and Gas Federal Well Projections				
Projected Total Productive Nonfederal Wells				
Remaining Number of Existing Productive Nonfederal Wells	605	605	605	605
Projected Productive New Nonfederal Wells	1,243	1,243	1,243	1,243
Total Number Productive Nonfederal Wells	**1,848**	**1,848**	**1,848**	**1,848**
Cumulative Productive Wells				
Total Number Productive Federal Wells	1,328	891	1,326	1,320
Total Number Productive Nonfederal Wells	1,848	1,848	1,848	1,848
Total Productive Wells	**3,176**	**2,739**	**3,174**	**3,168**

[1] Information is based upon historical data and professional experience with past like events.

Table M-3. Reasonable Foreseeable Development for Development Other than Oil and Gas

Type of Development	Alternative A	Alternative B	Alternative C	Alternative D (Proposed RMP)
Mineral Resources – Coal				
We have one active coal operation (Pittsburg and Midway), with existing federal coal leases involved.	This alternative's acreage includes possible surface mining on a new area, the Pittsburg and Midway North Block, which involves existing federal coal leases and some private land.	Same comment as A	This alternative includes the North Block (see Alternative A), as well as the proposed Haystack surface coal mine. Mining on Haystack may occur approximately 10 years after RMP approval.	Same comment as C
Mineral Resources – Other Solid Leasables				
Only anticipated disturbance in regards to other solid leasable minerals is for trona (sodium). Surface disturbance includes anticipated drilling, pipelines, roads, and so on, for tailings injection into abandoned mine workings, water monitoring, trona exploration, and for solution mining of trona. Other surface disturbance includes borrow pits for fill dirt to construct berms around tailings ponds. No new conventional underground mines are anticipated during the life of the plan.				
Mineral Resources – Salables				
Additional refinement of acreages for private land salable mineral disturbance may be obtained from the Wyoming DEQ – Lander. Also see note under Locatables section (i.e., acreage for salables could increase and locatables decrease).				
There are presently 24 FHA materials sites authorized, for a total of 1,930 acres. Over the last 20 years, 16 sites were authorized, for a total of 1,313 acres. For the four alternatives, we can assume that over a 20 year period, we would authorize 1,300 acres for FHA materials sites.				

Table M-3. Reasonable Foreseeable Development for Development Other than Oil and Gas (Continued)

Type of Development	Alternative A	Alternative B	Alternative C	Alternative D (Proposed RMP)
Mineral Resources – Locatable Minerals				
We have one ongoing building stone operation and two proposed. Some or most of these acreages could end up in the salable category, depending on the outcome of common variety determinations for building stone on the individual areas.		Other Management Areas could significantly affect one proposed operation.		Same comment as B
Fire and Fuels Management				
Management Ignited Prescribed Fire	2,000 acres/year	2,000 acres/year	0 acres/year	2,000 acres/year
Fuels Management	150 acres/year	150 acres/year	0 acres/year	150 acres/year
Acres reclaimed from fuels/veg mgt projects are presumed to naturally revegetate. The BLM does not anticipate implementing reclamation in these areas.				
Invasive Nonnative Species - *The projected numbers may be limited by budget available. These estimates are best available information based on recent management efforts and emphasis on noxious weed control.*				
Control of noxious weeds and nonnative plants, unrelated to surface disturbance projects	1,000 acres/year	1,000 acres/year	1,000 acres/year	1,000 acres/year
Range Improvement Projects	100 acres/year	100 acres/year	100 acres/year	100 acres/year
Prescribed Fire	100 acres/year	100 acres/year	0 acres/year	100 acres/year
Chemical Treatments (Spike)	20 acres/year	0 acres/year	20 acres/year	20 acres/year
Mechanical Treatments	20 acres/year	0 acres/year	20 acres/year	20 acres/year
BLM Road Maintenance: Assumes 8 feet either side of road	400 miles/year	400 miles/year	400 miles/year	400 miles/year
Forests and Woodlands	1,000 acres	600 acres	1,600 acres	3,200 acres
Federal Oil and Gas Well Activities: Assumes 40 percent requires treatment on short-term disturbance and 15 percent requires treatment on long-term disturbance.				
Renewable Energy Projects: Assumes 10 percent requires treatment.				
ROWs: Assumes 10 percent requires treatment.				

Table M-3. Reasonable Foreseeable Development for Development Other than Oil and Gas (Continued)

Type of Development	Alternative A	Alternative B	Alternative C	Alternative D (Proposed RMP)
Lands and Realty				
Wind Energy	Applications on file for wind testing	All acres within the planning area minus the restricted area of 33,345 acres associated with Raymond Mountain and the Bridger Antelope Trap	Acres based on map showing areas available for development	Acres based on map showing areas available for development
Projections on ROW do not include mineral development associated actions. They are based on historic activity of the last 20 years.				
Projected BLM roads based on securing access to the areas as described in the alternatives – estimated at 2 miles per road for this exercise.				
Other facilities are leases, such as airport leases, R&PP leases, land use permits, and so on.				
Livestock Grazing				
Spring Development – Total Number of Projects	50	50	50	50
Well Development – Total Number of Projects	20	20	20	20
Pipeline Development – Total Number of Projects	15	15	15	15
Fence Development – Total Number of Projects	75	75	75	75
Reservoir Maintenance Development– Total Number of Projects	34	34	34	34

BLM	Bureau of Land Management	R&PP	Recreation and Public Purposes
DEQ	Department of Environmental Quality	RMP	Resource Management Plan
FHA	Federal Highway Administration	ROW	rights-of-way

[1] Information is based upon historical data and professional experience with past like events.

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PROPOSED RESOURCE MANAGEMENT PLAN AND
FINAL ENVIRONMENTAL IMPACT STATEMENT

Appendix N

Wyoming Bureau of Land Management Mitigation Guidelines for Surface-Disturbing and Disruptive Activities

Appendix N
Wyoming Bureau of Land Management
Mitigation Guidelines for Surface-Disturbing and Disruptive Activities

Wyoming Mitigation Guidelines are a compilation of practices employed by Bureau of Land Management (BLM) to mitigate impacts from surface disturbance. They apply to activities such as road or pipeline construction, range improvements, and permitted recreation activities. The guidelines are designed to protect resources such as soils and vegetation, wildlife habitat, and cultural or historic properties. The guidelines are presented as an appendix of the Resource Management Plan (RMP) Environmental Impact Statement (EIS) for easy reference as they apply to many resources and derive from many laws. All BLM RMPs have included these guidelines as appendices. Public comment on the guidelines, per se, has not been requested. The guidelines are not land use decisions; rather they are examples of mitigation measures that could be applied, as appropriate, based on site-specific National Environmental Policy Act (NEPA) analysis for individual proposals. Comment on the use and application of specific mitigation measures can be made during the NEPA process for individual proposals. Because mitigation measures change or are modified, based on new information, the guidelines are updated periodically for all Field Offices in Wyoming.

These guidelines are primarily for the purpose of attaining statewide consistency in how requirements are determined for avoiding and mitigating environmental impacts and resource and land use conflicts. Consistency in this sense does not mean that identical requirements would be applied for all similar types of land use activities that may cause similar types of impacts. Nor does it mean that the requirements or guidelines for a single land use activity would be identical in all areas.

There are two ways the mitigation guidelines are used in the RMP and EIS process: (1) as part of the planning criteria in developing the RMP alternatives; and (2) in the analytical processes of both developing the alternatives and analyzing the impacts of the alternatives. In the first case, an assumption is made that any one or more of the mitigations will be appropriately included as conditions of relevant actions being proposed or considered in each alternative. In the second case, the mitigations are used (1) to develop a baseline for measuring and comparing impacts among the alternatives; (2) to identify other actions and alternatives that should be considered; and (3) to help determine whether more stringent or less stringent mitigations should be considered.

The EIS for the RMP does not decide or dictate the exact wording or inclusion of these guidelines. Rather, the guidelines are used in the RMP EIS process as a tool to help develop the RMP alternatives and to provide a baseline for comparative impact analysis in arriving at RMP decisions. These guidelines will be used in the same manner in analyzing activity plans and other site-specific proposals. These guidelines and their wording are matters of policy. As such, specific wording is subject to change primarily through administrative review, not through the RMP EIS process. Any further changes that may be made in the continuing refinement of these guidelines and any development of program-specific standard stipulations will be handled in another forum, including appropriate public involvement and input.

Purpose

The purposes of the “Wyoming BLM Mitigation Guidelines” are (1) to reserve, for the BLM, the right to modify the operations of all surface and other human presence disturbance activities as part of the statutory requirements for environmental protection; and (2) to inform a potential lessee, permittee, or operator of the requirements that must be met when using BLM-administered public lands. These guidelines have been written in a format that will allow for (1) their direct use as stipulations, and (2) the addition of specific or specialized mitigation following the submission of a detailed plan of development or other project proposal, and an environmental analysis.

Those resource activities or programs currently without a standardized set of permit or operation stipulations can use the mitigation guidelines as stipulations or as conditions of approval, or as a baseline for developing specific stipulations for a given activity or program.

Because use of the mitigation guidelines was integrated into the RMP EIS process and will be integrated into the site-specific environmental analysis process, the application of stipulations or mitigation requirements derived through the guidelines will provide more consistency with planning decisions and plan implementation than has occurred in the past. Application of the mitigation guidelines to all surface and other human presence disturbance activities concerning BLM-administered public lands and resources will provide more uniformity in mitigation than has occurred in the past.

Mitigation Guidelines

Surface Disturbance Mitigation Guideline

Surface disturbance will be prohibited in any of the following areas or conditions. Exception, waiver, or modification of this limitation may be approved in writing, including documented supporting analysis, by the authorized officer.

- Slopes in excess of 25 percent.
- Within important scenic areas (Class I and II Visual Resource Management Areas).
- Within 500 feet of surface water and/or riparian areas.
- Within either one-quarter mile or the visual horizon (whichever is closer) of historic trails.
- Construction with frozen material or during periods when the soil material is saturated or when watershed damage is likely to occur.

Guidance

The intent of the surface disturbance mitigation guideline is to inform interested parties (potential lessees, permittees, or operators) that when one or more of the five conditions exist, surface-disturbing activities will be prohibited unless or until a permittee or his designated representative and the surface management agency arrive at an acceptable plan for mitigation of anticipated impacts. This negotiation will occur prior to development.

Specific criteria (e.g., 500 feet from water) have been established based upon the best information available. However, such items as geographical areas and seasons must be delineated at the field level. Exception, waiver, or modification of requirements developed from this guideline must be based upon environmental analysis of proposals (e.g., activity plans, plans of development, plans of operation, and applications for permit to drill) and, if necessary, must allow for other mitigation to be applied on a site-specific basis.

Wildlife Mitigation Guideline

A. To protect important big game winter habitat, activities or surface use will not be allowed from November 15 to April 30 within certain areas encompassed by the authorization. The same criteria apply to defined big game birthing areas from May 1 to June 30.

Application of this limitation to operation and maintenance of a developed project must be based on environmental analysis of the operational or production aspects.

Exception, waiver, or modification of this limitation in any year may be approved in writing, including documented supporting analysis, by the authorized officer.

B. To protect important raptor and/or sage and sharp-tailed grouse nesting habitat, activities or surface use will not be allowed from February 1 to July 31 within certain areas encompassed by the authorization. The same criteria apply to defined raptor and game bird winter concentration areas from November 15 to April 30.

Application of this limitation to operation and maintenance of a developed project must be based on environmental analysis of the operational or production aspects.

Exception, waiver, or modification of this limitation in any year may be approved in writing, including documented supporting analysis, by the authorized officer.

C. No activities or surface use will be allowed on that portion of the authorization area identified within (legal description) for the purpose of protecting (e.g., sage/sharp-tailed grouse breeding grounds, and/or other species/activities) habitat.

Exception, waiver, or modification of this limitation in any year may be approved in writing, including documented supporting analysis, by the authorized officer.

D. Portions of the authorized use area legally described as (legal description), are known or suspected to be essential habitat for (name) which is a threatened or endangered species. Prior to conducting any onsite activities, the lessee/permittee will be required to conduct inventories or studies in accordance with BLM and U.S. Fish and Wildlife Service guidelines to verify the presence or absence of this species. In the event that (name) occurrence is identified, the lessee/permittee will be required to modify operational plans to include the protection requirements of this species and its habitat (e.g., seasonal use restrictions, occupancy limitations, facility design modifications).

Guidance

The Wildlife Mitigation Guideline is intended to provide two basic types of protection: seasonal restriction and prohibition of activities or surface use (2c). Item 2d is specific to situations involving threatened or endangered species. Legal descriptions will ultimately be required and should be measurable and legally definable. There are no minimum subdivision requirements at this time. The area delineated can and should be defined as necessary, based upon current biological data, prior to the time of processing an application and issuing the use authorization. The legal description must eventually become a part of the condition for approval of the permit, plan of development, and/or other use authorization.

The seasonal restriction section identifies three example groups of species and delineates three similar time frame restrictions. The big game species including elk, moose, deer, antelope, and bighorn sheep, all require protection of crucial winter range between November 15 and April 30. Elk and bighorn sheep also require protection from disturbance from May 1 to June 30, when they typically occupy distinct calving and lambing areas. Raptors include eagles, accipiters, falcons (peregrine, prairie, and merlin), buteos (ferruginous and Swainson's hawks), osprey, and burrowing owls. The raptors and sage and sharp-tailed grouse require nesting protection between February 1 and July 31. The same birds often require protection from disturbance from November 15 through April 30 while they occupy winter concentration areas.

Item 2c, the prohibition of activity or surface use, is intended for protection of specific wildlife habitat areas or values within the use area that cannot be protected by using seasonal restrictions. These areas or values must be factors that limit life-cycle activities (e.g., sage-grouse strutting grounds, known threatened and endangered species habitat).

Exception, waiver, or modification of requirements developed from this guideline must be based upon environmental analysis of proposals (e.g., activity plans, plans of development, plans of operation, applications for permit to drill) and, if necessary, must allow for other mitigation to be applied on a site-specific basis.

Cultural Resource Mitigation Guideline

When a proposed discretionary land use has potential for affecting the characteristics, which qualify a cultural property for the National Register of Historic Places (NRHP), mitigation will be considered. In accordance with Section 106 of the Historic Preservation Act, procedures specified in 36 Code of Federal Regulation (CFR) 800 will be used in consultation with the Wyoming State Historic Preservation Officer and the Advisory Council on Historic Preservation in arriving at determinations regarding the need and type of mitigation to be required.

Guidance

The preferred strategy for treating potential adverse effects on cultural properties is “avoidance.” If avoidance involves project relocation, the new project area may also require cultural resource inventory. If avoidance is imprudent or unfeasible, appropriate mitigation may include excavation (data recovery), stabilization, monitoring, protection barriers and signs, or other physical and administrative measures.

Reports documenting results of cultural resource inventory, evaluation, and the establishment of mitigation alternatives (if necessary) shall be written according to standards contained in BLM Manuals, the cultural resource permit stipulations, and in other policy issued by the BLM. These reports must provide sufficient information for Section 106 consultation. Reports shall be reviewed for adequacy by the appropriate BLM cultural resource specialist. If cultural properties on, or eligible for, the NRHP are located within these areas of potential impact and cannot be avoided, the authorized officer shall begin the Section 106 consultation process in accordance with the procedures contained in 36 CFR 800.

Mitigation measures shall be implemented according to the mitigation plan approved by the BLM authorized officer. Such plans are usually prepared by the land use applicant according to BLM specifications. Mitigation plans will be reviewed as part of Section 106 consultation for NRHP eligible or listed properties. The extent and nature of recommended mitigation shall be commensurate with the significance of the cultural resource involved and the anticipated extent of damage. Reasonable costs for mitigation will be borne by the land use applicant. Mitigation must be cost effective and realistic. It must consider project requirements and limitations, input from concerned parties, and are BLM approved or BLM formulated.

Mitigation of paleontological and natural history sites will be treated on a case-by-case basis. Factors such as site significance, economics, safety, and project urgency must be taken into account when making a decision to mitigate. Authority to protect (through mitigation) such values is provided for in FLPMA, Section 102(a)(8). When avoidance is not possible, appropriate mitigation may include excavation (data recovery), stabilization, monitoring, protection barriers and signs, or other physical and administrative protection measures.

Special Resource Mitigation Guideline

To protect (resource value), activities or surface use will not be allowed (i.e., within a specific distance of the resource value or between date to date) in (legal description).

Application of this limitation to operation and maintenance of a developed project must be based on environmental analysis of the operational or production aspects.

Exception, waiver, or modification of this limitation in any year may be approved in writing, including documented supporting analysis, by the authorized officer.

Example Resource Categories (Select or identify category and specific resource value):

a. Recreation areas.
b. Special natural history or paleontological features.
c. Other management areas.
d. Sections of major rivers.
e. Prior existing rights-of-way.
f. Occupied dwellings.
g. Other (specify).

Guidance

The *Special Resource Mitigation Guideline* is intended for use only in site-specific situations where one of the first three general mitigation guidelines will not adequately address the concern. The resource value, location, and specific restrictions must be clearly identified. A detailed plan addressing specific mitigation and special restrictions will be required prior to disturbance or development and will become a condition for approval of the permit, plan of development, or other use authorization.

Exception, waiver, or modification of requirements developed from this guideline must be based upon environmental analysis of proposals (e.g., activity plans, plans of development, plans of operation, applications for permit to drill) and, if necessary, must allow for other mitigation to be applied on a site-specific basis.

No Surface Occupancy Guideline

No Surface Occupancy (NSO) for fluid minerals will be allowed on the following described lands (legal description) because of (resource value).

Example Resource Categories (Select or identify category and specific resource value):

a. Recreation Areas (e.g., campgrounds, historic trails, national monuments).

b. Major reservoirs/dams.

c. Other management area (e.g., known threatened or endangered species habitat, areas suitable for consideration for wild and scenic rivers designation).

d. Other (specify).

Guidance

The *No Surface Occupancy Mitigation Guideline* is intended for use only when other mitigation is determined insufficient to adequately protect the public interest and is the only alternative to “no development” or “no leasing.” The legal description and resource value of concern must be identified and be tied to an NSO for fluid minerals land use planning decision.

Waiver of, or exception(s) to, the NSO for fluid minerals requirement will be subject to the same test used to initially justify its imposition. If, upon evaluation of a site-specific proposal, it is found that less restrictive mitigation would adequately protect the public interest or value of concern, then a waiver or exception to the NSO for fluid minerals requirement is possible. The record must show that because conditions or uses have changed, less restrictive requirements will protect the public interest. An environmental analysis must be conducted and documented (e.g., environmental assessment, environmental impact statement, etc., as necessary) in order to provide the basis for a waiver or exception to an NSO planning decision. Modification of the NSO for fluid minerals requirement will pertain only to refinement or correction of the location(s) to which it applied. If the waiver, exception, or modification is found to be consistent with the intent of the planning decision, it may be granted. If found inconsistent with the intent of the planning decision, a plan amendment would be required before the waiver, exception, or modification could be granted.

When considering the “no development” or “no leasing” option, a rigorous test must be met and fully documented in the record. This test must be based upon stringent standards described in the land use planning document. Since rejection of all development rights is more severe than the most restrictive mitigation requirement, the record must show that consideration was given to development subject to reasonable mitigation, including “no surface occupancy.” The record must also show that other mitigation was determined to be insufficient to adequately protect the public interest. A “no development” or “no leasing” decision should not be made solely because it appears that conventional methods of development would be unfeasible, especially where an NSO restriction for fluid minerals may be acceptable to a potential permittee. In such cases, the potential permittee should have the opportunity to decide whether or not to go ahead with the proposal (or accept the use authorization), recognizing that an NSO restriction for fluid minerals is involved.

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Appendix O

Best Management Practices

Appendix O
Best Management Practices

Best management practices (BMPs) are environmental protection measures developed by governmental bodies, industry, and scientific or other working groups. These practices are not stipulations, but rather serve to improve design and reduce the environmental impact of proposed Bureau of Land Management (BLM) management actions in the planning area. Public land users are encouraged to review these practices, incorporate them where appropriate, or develop better methods for achieving the same goal.

The purpose of this section is not to attempt to select certain practices or designs and require that only those be used. It is not possible to evaluate all the known practices and make determinations as to which are best. What is best must be determined as a result of a site-specific investigation of the proposed management action. No one management practice is best suited to every site or situation. BMPs must be adaptive and monitored regularly to evaluate effectiveness.

The following sources contain significant information regarding the development and implementation of BMPs. These references are not to be considered as exclusive sources of information; rather, they should be used as a starting point when evaluating specific BMPs during the project design and implementation.

Wyoming Department of Environmental Quality
http://deq.state.wy.us/wqd/watershed/#Planning

Bureau of Land Management
http://www.blm.gov/bmp/

U.S. Environmental Protection Agency
http://www.epa.gov/owow/nps/
http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm

U.S. Department of Agriculture – Natural Resources Conservation Service
http://www.nrcs.usda.gov/Technical/Standards/nhcp.html
http://www.glti.nrcs.usda.gov/technical/publications/nrph.html

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Appendix P

Relevant Statutes, Limitations, and Guidelines

Appendix P
Relevant Statutes, Limitations, and Guidelines

Numerous federal and state laws and applicable regulations, policies, and actions could impact the alternatives analyzed in this EIS. This section describes select authorities that apply to the selection and implementation of alternatives identified in this EIS. This is not an exhaustive list of relevant statutes, limitations, and guidelines; many statutes apply across multiple programs.

Environmental Policy

NEPA requires the preparation of EISs for major federal actions that may significantly affect the human environment. It requires systematic, interdisciplinary planning to ensure the integrated use of natural and social sciences and environmental design when making decisions about major federal actions that could affect the environment. The procedures required under NEPA are implemented through the CEQ regulations at 40 CFR 1500.

An Executive Order (EO) regarding federal compliance with pollution control standards (EO 12088) requires that federal agencies comply with applicable pollution control standards. NEPA also requires the BLM to "… promote efforts which will prevent or eliminate damage to the environment …" and to "… attain the widest range of beneficial uses…without degradation, risk to health and safety, or other undesirable and unintended consequences…" (NEPA [42 USC § 4321 et seq.], as amended).

An EO regarding protection and enhancement of environmental quality (EO 11514, as amended by EO 11991) establishes the policy for federal agencies to provide leadership in environmental protection and enhancement.

Land Use and Natural Resources Management

FLPMA provides for public lands to be generally retained in federal ownership for periodic and systematic inventory of the public lands and their resources; for a review of existing withdrawals and classifications; for establishing comprehensive rules and regulations for administering public lands statutes after considering the views of the general public; for adjudication procedures that assure adequate third party participation, objective administrative review of decisions, and expeditious decision making; for multiple-use management on a sustained yield basis; for protection of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; for preservation and protection of certain public lands in their natural condition, where appropriate; for providing food and habitat for fish and wildlife and domestic animals, for providing outdoor recreation and human occupancy and use; for receiving fair market value for the use of the public lands and their resources; for establishing uniform procedures for any disposal, acquisition, or exchange; for protecting ACECs; for recognizing the Nation's need for domestic sources of mineral, food, timber, and fiber from the public lands, including implementing the Mining and Mineral Policy Act of 1970; and for payments to compensate states and local governments for burdens created as a result of the immunity of federal lands from state and local taxation. The general land management regulations are provided in 43 CFR 2000, Subchapter B.

The Taylor Grazing Act of 1934, as amended (43 USC 315), provides authorization to the Secretary of the Interior to establish grazing districts from any part of the public domain of the United States (exclusive of Alaska) which, in the Secretary's opinion, are chiefly valuable for grazing and raising forage crops; could regulate and administer grazing use of all public lands; and could improve the public rangelands. Regulations for grazing permits and leases are provided in 43 CFR 4100.

The Public Rangelands Improvement Act of 1978 (43 USC 1901, et seq.) provides for the improvement of range conditions on public rangelands, research on wild horse and burro population dynamics, and other range management practices.

The Federal Noxious Weed Act of 1974, as amended (7 USC 2814), provides for establishing and funding of an undesirable plant management program, completing and implementing cooperative agreements with state agencies, and establishing integrated management systems to control undesirable plant species.

The Wilderness Act of 1964 (16 USC 1131, et seq.) provides for the designation and preservation of wilderness areas.

EO 11987 (Exotic Organisms), signed May 24, 1977, requires federal agencies, to the extent permitted by law, to restrict the introduction of exotic species into the natural ecosystems on lands and waters owned or leased by the United States; to encourage states, local governments, and private citizens to prevent the introduction of exotic species into natural ecosystems of the United States; to restrict the importation and introduction of exotic species into any natural ecosystems as a result of activities they undertake, fund, or authorize; and to restrict the use of federal funds, programs, or authorities to export native species for introduction into ecosystems outside the United States where they do not occur naturally.

EO 13112 (Invasive Species), signed on February 3, 1999, prevents the introduction of invasive species and provides for their control, as well as to minimize the economic, ecological, and human health impacts that invasive species cause. Under this EO, federal agencies whose actions may affect the status of invasive species shall (1) identify such actions; (2) use relevant programs and authorities to prevent, control, monitor, and research such species; and (3) not authorize, fund, or carry out actions that are believed to likely cause or promote the introduction or spread of invasive species in the United States or elsewhere.

EO 12548 provides for establishment of appropriate fees for the grazing of domestic livestock on public rangelands and directs that the fees shall not be less than $1.35 per animal unit month.

Minerals

The General Mining Law of 1872, as amended (30 USC 22 (21), et seq.), provides for locating and patenting mining claims where a discovery has been made for locatable minerals on public lands in specified states. Regulations for staking and maintenance of claims on BLM-administered lands are listed in 43 CFR 3800.

The Mineral Leasing Act of 1920, as amended (30 USC 181, et seq.), provides for the leasing of deposits of coal, phosphate, sodium, potassium, oil, oil shale, gilsonite (including all vein-type solid hydrocarbons), or gas, and lands containing such deposits owned by the United States, including those in national forests, but excluding those acquired under other acts subsequent to February 25, 1920, and those lands within the national petroleum and oil shale reserves. Regulations for onshore oil and gas leasing are provided in 43 CFR 3100.

The Federal Coal Leasing Amendments Act of 1976 requires competitive leasing of coal on public lands and mandates a broad spectrum of coal operations requirements for lease management. Coal leasing regulations for BLM-administered lands are provided in 43 CFR 3400.

The Materials Act of 1947 (30 USC 601 et seq.) authorizes the disposal of vegetative materials, such as timber or other forest products, and mineral materials, such as sand, stone, or gravel, on public lands of the United States. The sales of forest products are governed by the regulations in 43 CFR 5400, while the regulations for the sale and free use of mineral materials are in 43 CFR 3600.

The Energy Policy Act of 2005 was signed into law on August 8, 2005. The act established a comprehensive, long-range energy policy. It provides incentives for traditional energy production, as well as newer, more efficient energy technologies and conservation attempts to combat growing energy challenges. It also provides tax incentives and loan guarantees for energy production of various types.

Air Quality

The Clean Air Act (CAA) of 1990, as amended (42 USC 7401, 7642) established objectives to protect air quality, maintain federal- and state-designated air quality standards, and abide by the requirements of the state implementation plans. The Regional Haze Regulations were developed by the U.S. Environmental Protection Agency (EPA) in response to the CAA Amendments of 1990. They are intended to maintain visibility on the least impaired days and improve visibility on the most impaired days in mandatory Federal Class I areas across the United States, so that visibility in these areas is returned to natural conditions by the year 2064. These regulations require states to submit a regional haze state implementation plan and progress reports to demonstrate reasonable progress toward the 2064 goal. Wyoming Air Quality Standards and Regulations specify the requirements for air permitting and monitoring to implement CAA and state ambient air quality standards.

Water Quality

The Clean Water Act of 1987, as amended (33 USC 1251), established objectives to restore and maintain the chemical, physical, and biological integrity of the Nation's water. The act also requires permits for point source discharges to navigable waters of the United States and the protection of wetlands. It also includes monitoring and research provisions for protection of ambient water quality.

Wyoming Water Quality Regulations implement permitting and monitoring requirements for the National Pollutant Discharge Elimination System, operation of injection wells, storm water permitting, groundwater protection requirements, prevention and response requirements for spills, and salinity standards and criteria for the Colorado River basin.

Protection of Wetlands (EO 11990) requires federal agencies to take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.

Floodplain Management (EO 11988) provides for the restoration and preservation of national and beneficial floodplain values, as well as enhancement of the natural and beneficial values of wetlands in carrying out programs affecting land use.

Cultural Resources

The Historic Sites Act (16 USC 461 et seq.) declares national policy to identify and preserve historic sites, buildings, and objects, of national significance, thereby providing a foundation for the National Register of Historic Places (NRHP).

The National Historic Preservation Act of 1966, as amended (16 USC 470 et seq.), expands protection of historic and archeological properties to include those of national, state, and local significance. It also directs federal agencies to consider the effects of proposed actions on properties eligible for or included in the NRHP.

The Archaeological Resources Protection Act of 1979, as amended (16 USC 470cc, 470ee), requires permits for the excavation or removal of federally administered archeological resources, encourages increased cooperation among federal agencies and private individuals, provides stringent criminal and civil penalties for violations, and requires federal agencies to identify important resources vulnerable to looting and to develop a tracking system for violations.

The Native American Graves Protection and Repatriation Act of 1990 (32 USC 3001 et seq.) provides a process for federal agencies to return certain Native American cultural items (e.g., human remains, funerary objects, sacred objects, and objects of cultural patrimony) to lineal descendants and culturally affiliated Native American tribes.

The National Trails System Act of 1968, as amended (16 USC 1241 et seq.), establishes a national trails system and provides that federal rights in abandoned railroads may be retained for trail or recreation purposes.

Protection and Enhancement of the Cultural Environment (EO 11593) directs federal agencies to locate, inventory, nominate, and protect federally owned cultural resources eligible for the NRHP and to ensure that their plans and programs contribute to preservation and enhancement of nonfederally owned resources.

The *Programmatic Agreement among the Bureau of Land Management, Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers Regarding the Manner in which BLM will Meet its Responsibilities Under the National Historic Preservation Act* (National Programmatic Agreement [NPA]) expresses how the BLM will meet its responsibilities under Sections 106, 110 and 111 (a) of the National Historic Preservation Act (NHPA) through the implementation of mechanisms agreed to in the NPA. The *State Protocol Between The Wyoming Bureau of Land Management and The Wyoming State Historic Preservation Officer* (Protocol) describes the manner in which the Wyoming State Historic Preservation Officer and the BLM will interact and cooperate under that NPA.

Hazardous Materials

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (42 USC 9601-9673), provides for liability, risk assessment, compensation, emergency response, and cleanup (including the cleanup of inactive sites) for hazardous substances. The Act requires federal agencies to report sites where hazardous wastes are or have been stored, treated, or disposed, and requires responsible parties to clean up releases of hazardous substances.

The Resource Conservation and Recovery Act, as amended by the Federal Facility Compliance Act of 1992 (42 USC 6901-6992), authorizes the EPA to manage hazardous wastes on active disposal operations. The Act waives sovereign immunity for federal agencies with respect to federal, state, and local solid and hazardous waste laws and regulations. Federal agencies may be subject to civil and administrative penalties for violations and to cost assessments for the administration of enforcement.

The Emergency Planning and Community Right-To-Know Act of 1986 (42 USC 11001-1050) requires the private sector and federal, state, local, and tribal governments to inventory chemicals and chemical products, to report those in excess of threshold planning quantities, to inventory emergency response equipment, to provide annual reports and support to local and state emergency response organizations, and to maintain liaisons with the local and state emergency response organizations and the public.

Forest Resources

The Healthy Forests Restoration Act of 2003 (16 USC 6501 et seq.) contains provisions to expedite and streamline the preparation and implementation of hazardous fuel reduction and forest restoration projects on specific types of at-risk federal lands to increase and improve forest and rangeland health and to prevent the damage caused by catastrophic wildfires.

The Materials Act of 1947 authorizes the disposal of vegetative materials, such as timber or other forest products, and mineral materials, such as sand, stone, or gravel, on public lands of the United States. The sales of forest products are governed by the regulations in 43 CFR 5400, while the regulations for the sale and free use of mineral materials are in 43 CFR 3600.

Wildlife

The ESA of 1973, as amended (16 USC 1531 et seq.), directs federal agencies to ensure that their actions do not jeopardize the continued existence of threatened and endangered species or their critical habitat, and that through their authority they help bring about the recovery of such species.

The Bald Eagle Protection Act of 1940 (16 USC 668), amended in 1962 to include the golden eagle, prohibits the taking or possession of and commerce in bald and golden eagles, with limited exceptions.

The Fish and Wildlife Coordination Act of 1958 (16 USC 661 et seq.) provides that whenever the waters or channels of a body of water are modified by a department or agency of the United States, the department or agency will first consult with the USFWS and with the head of the agency exercising administration over the wildlife resources of the state where construction will occur, with a view to the conservation of wildlife resources.

The Fish and Wildlife Improvement Act of 1978 (16 USC 742l) authorizes the Secretary of the Interior and the Secretary of Commerce to assist in the training of state fish and wildlife enforcement personnel, to cooperate with other federal or state agencies to enforce fish and wildlife laws, and to use appropriations to pay for rewards and undercover operations.

The Fish and Wildlife Conservation Act of 1980, as amended (16 USC 2901-2912), commonly known as the Nongame Act, recognizing that nongame fish and wildlife possess ecological, educational, aesthetic, cultural, recreational, economic, or scientific value, encourages states to develop conservation plans to restore and maintain fish and wildlife populations. The states may be reimbursed for a percentage of the costs of developing, revising, or implementing conservation plans approved by the Secretary of the Interior. Amendments adopted in 1988 and 1989 also direct the Secretary to undertake certain activities to research and conserve migratory nongame birds.

The Migratory Bird Treaty Act of 1918 (16 USC et seq.) manages and protects migratory bird species through consultation with state and local governments and protection of land and water resources necessary for the conservation of migratory birds. Under the Act, taking, killing, or possessing migratory birds is unlawful.

The Sikes Act of 1960 (16 USC 670a-670o), as amended, Public Law (Pub. L.) 86-797, provides for cooperation by the USDI and the U.S. Department of Defense with state agencies in the planning, development, and maintenance of fish and wildlife resources on military reservations throughout the United States. Pub. L. 93-452, signed in 1974, authorized conservation and rehabilitation programs on BLM lands. Pub. L. 97-396, approved in 1982, provided for the inclusion of endangered plants in conservation programs developed for BLM lands. It also distinguished between “cooperative plans” with states and “Cooperative Agreements” under federal law, and clarified section 209 concerning purchases and contracts for property and services from states.

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Appendix Q

Alternative B1 Analysis

Appendix Q
Alternative B1 Analysis

In response to comments received on the Draft RMP and EIS, the BLM considered allowing new fluid mineral leasing with a no surface occupancy (NSO) restriction within portions of the Rock Creek/Tunp and Bear River Divide areas and areas of large, contiguous blocks of federal land containing sagebrush, mountain shrub, and aspen habitat. All new leases, including those that expire in these areas, would be offered with an NSO restriction.

The BLM focused the following preliminary analysis on key resources and resource uses that could be impacted by this potential new alternative, called Alternative B1, including Air Quality, Soil, Water, Leasable Minerals – Oil and Gas, Vegetation – Forests, Woodlands, and Forest Products, Vegetation – Grassland and Shrubland Communities, Vegetation – Riparian and Wetland Communities, Fish and Wildlife Resources – Wildlife, Special Designations (Rock Creek/Tunp and Bear River Divide), Social Conditions, and Economic Conditions. Based on the results of a preliminary analysis below, the BLM determined that Alternative B1 would not be implemented as part of the RMP or analyzed in detail. The BLM believes the Proposed RMP provides the best balance for resource protection and use over the life of the plan. In addition, the impacts of placing an NSO restriction on the identified large block areas increases and displaces disturbance to adjacent private and state lands. Therefore, this alternative does not meet the purpose and need of the RMP revision as it does not achieve the established goals and objectives nor does it enable reaching desired outcomes.

1.1 Physical Resources

1.1.1 Air Quality

Emissions in Alternative B1 from currently unleased BLM-administered surface would be the same as those in Alternative B. However, emissions from activities on adjacent existing federal fluid mineral leases and private and state land would be higher if additional wells are drilled to access federal mineral estate. The drilling of up to 40 additional wells on adjacent existing federal fluid mineral leases and private or state land over 20 years would result in the following additional emissions on an annual average basis: about 2.5 tons per year of PM_{10}, 0.6 ton per year of $PM_{2.5}$, 8.9 tons per year of NO_x, 0.3 ton per year of SO_2, 1.5 tons per year of CO, 0.5 ton per year of VOCs, and 0.05 ton per year of HAPs. These emissions estimates include fugitive dust from well pad and station construction, as well as emissions from heavy equipment and commuting vehicles. Because the additional wells identified in Alternative B1 would all be directionally or horizontally drilled, drilling operations would likely take longer than for most vertical wells, which would result in additional emissions from equipment use. For the emissions described above, equipment use is the primary contributor to NO_x, SO_2, CO, VOC, and HAP emissions; thus, increased drilling timeframes would result in higher emissions for these pollutants in particular, compared to Alternative B.

Wells that are completed and productive would generate some additional emissions, but since BLM has not predicted the completion rate for the 40 exploratory wells in Blocks A, B, and C, BLM also did not estimate the exact emissions associated with completion and production from these wells. Emissions in Alternative B1 would be well below the levels associated with Alternative A and greater than the levels predicted with Alternative B.

Under this alternative, like Alternative B, impacts on AQRVs at the nearest Class I areas would be similar to base year conditions. Given the generally good air quality existing in the project region, emissions from Alternative B1 (even with longer drilling timeframes and emissions from any wells completed) would have a low potential to contribute to an exceedance of National Ambient Air Quality Standards (NAAQS) or Wyoming Ambient Air Quality Standards (WAAQS). Implementing the mitigations identified for Alternative A would also reduce emissions and air quality impacts associated with Alternative B1.

1.1.2 Soil

Surface-disturbing Activities. Under this alternative, projected short-term disturbance from all BLM actions will affect 116,340 acres, slightly greater than under Alternative B. Following reclamation of disturbed sites, the projected long-term disturbance acreage is 50,333 acres (see Appendix M). Under Alternative B1, an estimated 92 percent of the planning area's federal mineral estate is administratively unavailable for oil and gas leasing or has major constraints. The land within the Green River Basin Uplands soil group, where the majority of the highly erodible soils occur, will experience less surface disturbance than under Alternative A and more surface disturbance than under Alternative B. Due to the NSO lease stipulations in the contiguous public land areas east and west of Kemmerer, an additional 40 wells will be developed compared to Alternative B, with the resulting increase in short- and long-term surface disturbance, approximately 8,600 acres and 2,200 acres respectively in the Green River Basin Uplands. This surface disturbance will be concentrated near the boundaries of existing oil and gas leases and on non-federal lands to facilitate horizontal or directional drilling into leases with NSO stipulations.

This alternative results in low erosion potential and the good long-term soil productivity, with impacts to soils greater only than Alternative B. The prohibition of surface-disturbing activities on highly erosive soils with 10 percent or more slopes without adequate mitigation measures and other fragile soil areas will result in improved protections and reduce accelerated erosion rates, as compared to Alternative A.

Surface-Use Activities. Management of surface use activities under Alternative B1 are more stringent compared to Alternative A, resulting in increased protections from accelerated soil erosion. For example, compared to Alternative A, seeding of salvaged topsoil piles is required upon completion of construction activities, and surface disturbance during fire suppression is not allowed without the consent of the authorized officer.

Proactive Management Actions. Under Alternative B1, proactive management actions anticipated to avoid, reduce, or minimize adverse impacts to soils are greater than those described under Alternative A and slightly less than those described under Alternative B. Adverse impacts to soils under Alternative B1 are anticipated to be less compared to Alternative A and greater than under Alternative B.

1.1.3 Water

Surface Water Quality

Alternative B1 projects low long-term surface disturbance (50,333 acres) relative to other alternatives. Compared to Alternative A, there are fewer opportunities for surface-disturbing actions due to oil and gas development because fewer wells and associated roads are projected with a higher proportion of land that contains major constraints. Due to the NSO lease stipulations in the contiguous public land areas east and west of Kemmerer, an additional 40 wells will be developed compared to Alternative B, with the resulting concentration of surface disturbance for well pads and associated facilities near the boundaries of existing oil and gas leases and on non-federal lands.

Areas within ¼ mile of water bodies and wetlands are designated as NSO for fluid minerals to protect these resources and those that depend on them. More actions are designed to minimize stream bank erosion. Damaged wetlands will be restored, resulting in improved trends over the long term. This protection also results in the fewest adverse impacts to water quality, especially in the Colorado River basin.

Surface Water Quantity

Alternative B1 will result slightly more change to surface water quantity than Alternative B and less than under Alternative A, due to the projected number of oil and gas wells and the prohibition of surface disposal of produced waters on federally administered soil resources, which protects local streams. In addition, the prohibition would apply to federally produced water disposal on private surface.

Groundwater Quality and Quantity

Alternative B1 has low potential for oil and gas development, soil compaction, and vegetation disturbance. Requiring the lining of reserve pits and secondary containments on all facilities where oil or hazardous materials are stored or potential releases may occur, minimizes adverse impacts on groundwater quality from oil and gas operations. Alternative B1 provides protection of floodplains where the groundwater is shallow and vulnerable to contamination, resulting in protection for groundwater quality and quantity.

1.2 Mineral Resources

1.2.1 Leasable – Oil and Gas

Management actions implemented to protect other resource values may directly and indirectly impact new oil and gas leases, exploration, and development. A direct impact is one that either specifically prohibits or permits oil and gas leasing, exploration, or development. An example of a direct impact is the administrative decision to identify areas as administratively unavailable for new oil and gas leasing. Management actions that do not explicitly permit or prohibit oil and gas exploration and development activity, but may influence a company's decision on whether to proceed with a given project, are considered indirect impacts. Indirect impacts are the result of management actions that may place or remove restrictions or additional requirements on oil and gas exploration and development. An example of an indirect impact is a controlled surface use (CSU) restriction preventing certain activities to protect a wildlife habitat area. Short-term impacts occur in less than 5 years. For example, a timing limitation stipulation (TLS) or other seasonal restrictions may result in short-term impacts. Long-term impacts occur beyond the first 5 years and perhaps for the duration of the management plan. Administrative decisions to identify areas as administratively unavailable for oil and gas leasing result in long-term impacts if the decision exceeds 5 years.

1.2.1.1 Methods and Assumptions

The impact analysis used the following methods and assumptions:

- Analysis considered the baseline total unconstrained oil and gas development potential taken from the Reasonable Foreseeable Development (RFD) scenario for oil and gas (BLM 2006b) as summarized in Chapter 3 and applied the alternative constraints from the other resource programs as described in Chapter 2. The RMP will not modify existing leases; as old leases expire and new ones are issued, new leases would be subject to relevant stipulations. However, site-specific conditions of approval can be applied to APDs to avoid adverse impacts to resource values on existing leases per 43 CFR 3101.1-2.
- About 1,577,402 acres of federal mineral estate in the planning area have a moderate-to-high potential for the occurrence of oil and gas. Most of the planning area has a low development potential for oil and gas (BLM 2006b).
- Approximately 917,785 acres of federal mineral estate currently are leased in the planning area. Development of current leases under this RMP is subject to provisions in 43 CFR 3101.1-2.
- Where existing oil and gas leases occur, NSO restrictions for fluid minerals cannot be applied to the entire leasehold, as development must be allowed consistent with existing lease terms.
- The BLM can permit geophysical exploration activities in more restrictive visual resource management (VRM) areas because the operations are short-term activities.
- Geophysical permitting will be done on a case-by-case basis.

- Other federal agencies have included Fossil Butte, Cokeville Meadows, and Seedskadee National Wildlife Refuge in areas that are administratively unavailable for oil and gas leasing. However, the majority of Fossil Butte National Monument currently is leased, and a separate Land Use Plan provides guidance for future decisions regarding leasing.
- Areas administratively available for oil and gas leasing subject to major constraints have more adverse impacts on oil and gas leasing, exploration, and development compared to acres subject to either moderate constraints or standard stipulations. All areas identified as administratively available for oil and gas leasing are also referred to as "open" in this document and are subject to standard stipulations. In addition, some of these areas are subject to moderate and (or) major constraints.
- Moderate constraints are any stipulations that may restrict the timing or placement of an oil and gas development, but would not restrict the overall development. Moderate stipulations include all timing restrictions that by themselves or overlapping would not restrict the timing of development beyond 6 months, or would not require directional drilling techniques for more than ¼ mile (e.g., NSO for fluid minerals in specific sensitive plant populations, all wildlife restrictions where only one restriction occurs, restricts development on slopes greater than 25%).
- Major constraints are any stipulations that may restrict the timing or placement of oil and gas developments and may result in an operator dropping the development proposal. Major stipulations include timing restrictions that by themselves or overlapping would result in a timing restriction greater than 6 months regardless of any other less restrictive constraints in the same area. Also, restrictions that would require the use of directional drilling to reach targets over ¼ mile away (e.g., greater than ¼-mile NSO for fluid minerals, big game crucial winter range overlapped with raptor buffers, where developments are prohibited on slopes greater than 10% , etc.) are considered "major."
- NSO restrictions will limit drilling in some areas with federal minerals. Fluid minerals would need to be developed by directional or horizontal drilling from private/State lands or where the restriction is not in effect on federal lands (including existing leases without NSO stipulations).
- The RFD scenario for oil and gas (BLM 2006b) based development potential on the anticipated drilling activity over the next 20 years, with most of the development occurring as infill wells in existing fields.
- Moderate and major constraints identified for each alternative (see Chapter 2) were applied to the unconstrained RFD scenario for oil and gas development to develop Maps 8 through 11 and the RFD scenario for oil and gas development for each alternative.

1.2.1.2 Analysis of Alternatives

Impacts Common to All Alternatives

Under the regulations of 43 CFR 3150, the BLM is responsible for authorizing and administering geophysical exploration operations on all public surface lands within the planning area, while the WOGCC is responsible for authorizing all operations on state and private surface. Geophysical operations, which are entirely within a given lease, may also be approved under 43 CFR 3160 regulations, via sundry notice (form 3160). The information gained from geophysical exploration reduces the number of dry holes drilled during the field development stage, resulting in less unnecessary surface impacts and fewer impacts to other resources.

Areas within the planning area are classified as either administratively unavailable for oil and gas leasing or administratively available for oil and gas leasing, and subject to standard stipulations, major, or moderate constraints. The Raymond Mountain Wilderness Study Area (WSA) and the Mechanically Mineable Trona Area (MMTA) are administratively unavailable for oil and gas leasing under all alternatives. The area administratively available for oil and gas leasing subject to constraints varies by alternative.

Major constraints, such as NSO restrictions for fluid minerals, have the potential to adversely impact oil and gas exploration and development on new leases. For example, operators typically drill oil and gas wells vertically because the costs are lower and drilling problems are less likely. In some cases, an operator could place a drilling location, access road, or production facility in a less-sensitive area and drill the well directionally to recover reserves underlying the area with the surface-disturbance restriction. Directional drilling, however, is 1.25 to 4 times more costly than vertical drilling, and the increased costs could make some drilling ventures uneconomical. Operators can utilize directional drilling to tap oil and gas reserves on portions or margins of oil and gas leases in large contiguous areas subject to an NSO restriction for fluid minerals and employ this technology to develop isolated lease parcels subject to the same restriction. Since directional drilling has its horizontal limitations, operators could not develop all the oil and gas resources from all the acreage associated with large areas with an NSO restriction.

Impacts from moderate constraints, while adverse, are typically indirect and not as severe as those resulting from major restrictions. Moderate constraints may limit the timing of development activities or require specific mitigation, but they do not necessarily remove the acreage from development or require directional drilling. For example, under a TLS, development may become more intensive over a shorter timeframe to complete operations outside a TLS. In areas with overlapping TLS restrictions for wildlife, operators may be limited to when they can schedule development activities. In some cases, an operator may have to start development and then postpone operations during critical time periods. If the window during which work can be done is too short, a development project may have to be done in phases, requiring more time to complete, adding to the project's cost and prolonging the time before the investment is recovered. A company may decide not to develop the reserves if it considers the project marginal due to the additional requirements and added time and cost. Under BLM policy, however, lease stipulations and COAs are subject to exception, waiver, and modification (see Appendix F). Air emissions from drilling and production activities are allowed up to applicable standards and guidelines, which represent an additional limiting factor for oil and gas development within the planning area.

In portions of the planning area, conflicts have occurred under all alternatives between oil and gas and trona, and may occur in the future between oil and gas and coal. Since 2004, the BLM has been working with industries, regulatory agencies, and other land owners to study and resolve technical and safety issues regarding recovery of overlapping oil and gas and trona resources. The conclusion from the deliberations is that oil and gas development and trona mining are basically incompatible because of the exposure of the underground trona workforce to risks associated with nearby high-pressure gas wells. The preferred course of action is to administer the area exclusively for trona extraction until conventional trona mining is complete. Therefore, an area has been designated, the MMTA, in which oil and gas leasing and development are currently prohibited. No formal decision has yet been made on the management of the oil and gas and trona resources within the MMTA boundary. This decision will be a part of the revision of the Kemmerer RMP.

NSO restrictions for fluid minerals for protecting bald eagle winter roosts are the same under all alternatives. This restriction occurs in areas with moderate oil and gas development potential and results in a relatively minor adverse impact to oil and gas. Under all alternatives, geophysical exploration will be allowed throughout the Kemmerer Field Office area on a case-by-case basis.

Alternative B1

Areas Administratively Unavailable for Oil and Gas Leasing. Alternative B1 identifies 121,293 acres (8%) of the federal mineral estate in the planning area as administratively unavailable for new oil and gas leasing (Tables Q-1 and Q-2). These acres of administratively unavailable federal mineral estate are intended to protect resource values. Compared to all other alternatives, Alternative B1 identifies a relatively low acreage as administratively unavailable for additional oil and gas leasing. As under Alternative B, Alternative B1 identifies the MMTA as administratively unavailable for oil and gas leasing until the oil and gas resource can be recovered without compromising the safety of underground miners.

Table Q-1. Acres of Federal Mineral Estate Administratively Unavailable and Available for Oil and Gas Leasing Subject to Constraints by Alternative in the Kemmerer Planning Area

Restriction	Alternative A	Alternative B	Alternative B1	Alternative C	Alternative D (Proposed RMP)
Administratively Available with Standard Stipulations Percent (%) of Federal Mineral Estate	337,076 21%	7,718 <1%	7,718 <1%	360,472 23%	62,036 4%
Administratively Available with Moderate Constraints Percent (%) of Federal Mineral Estate	783,218 50%	118,071 7%	118,071 7%	776,850 49%	797,504 50%
Administratively Available with Major Constraints Percent (%) of Federal Mineral Estate	354,266 22%	643,515 41%	1,332,280 84%	337,238 21%	537,341 34%
Administratively Unavailable for Oil and Gas Leasing Percent (%) of Federal Mineral Estate	104,802 7%	810,058 51%	121,293 8%	104,802 7%	182,481 12%

Source: BLM 2006a

Note: Table includes mineral estate under other federal surface, as well as BLM, and includes areas exhibiting no, low, very low, moderate, and high development potential for oil and gas.

< less than

Table Q-2. Projected BLM Federal Wells Drilled by Alternative through 2020 in the Kemmerer Planning Area

	Coalbed Natural Gas Wells	Oil and Gas Wells	Total Wells
Projected Wells Drilled (2001 – 2020)[1]			
Baseline – Wells Drilled (Unconstrained)	**274**	**947**	**1,221**
Alternative A – Wells Drilled Percent Reduction from Baseline	223 19%	789 16%	1,012 17%
Alternative B – Wells Drilled Percent Reduction from Baseline	93 66%	410 57%	503 59%
Alternative B1 – Wells Drilled Percent Reduction from Baseline	113 59%	455 52%	568 53%
Alternative C – Wells Drilled Percent Reduction from Baseline	227 17%	793 16%	1,020 16%
Alternative D – Wells Drilled Percent Reduction from Baseline	226 18%	784 17%	1,010 17%
Projected Producing Wells (2001 – 2020)[1]			
Baseline – Producing Wells (Unconstrained)	**221**	**811**	**1,032**
Alternative A – Producing Wells Percent Reduction from Baseline	180 19%	686 16%	866 17%
Alternative B – Producing Wells Percent Reduction from Baseline	79 64%	350 57%	429 53%
Alternative B1 – Producing Wells Percent Reduction from Baseline	96 57%	387 52%	483 53%
Alternative C – Producing Wells Percent Reduction from Baseline	184 17%	680 16%	864 16%
Alternative D *(Proposed RMP)* – Producing Wells Percent Reduction from Baseline	183 18%	675 17%	858 17%

Source: BLM 2006b

[1] Well counts include federal wells only and do not include existing wells.

BLM Bureau of Land Management

Other Resource Restrictions. Under Alternative B1, 1,458,069 acres are administratively available for oil and gas leasing subject to standard stipulations (7,718 acres), moderate constraints (118,071 acres), and major constraints (1,332,280 acres) (Table Q-1). Compared to all other alternatives, Alternative B1 subjects the most area to major constraints, due to the high acreage of NSO stipulations, to protect resource values. Alternative B1 is anticipated to have direct and adverse impacts on new oil and gas development in the planning area by increasing the amount of directional or horizontal drilling required to extract oil or gas, thereby increasing the costs of drilling while allowing the extraction of more oil and gas in the contiguous BLM-administered habitat block identified as administratively unavailable under Alternative B. Compared to Alternative A, NSO restrictions for fluid minerals under Alternative B1 includes the area of contiguous public lands east and west of Kemmerer, as well as the areas with NSO restrictions under the other alternatives, such as all populations of *Physaria dornii*, a ¼-mile buffer around developed campgrounds, and the Alfred Corum and Nancy Hill emigrant gravesites and Emigrant Spring/Dempsey cultural sites. For existing oil and gas leases, NSO restrictions cannot be applied to the entire leasehold because development must be allowed consistent with existing lease terms. The NSO restrictions for fluid minerals under Alternative B1 would be applied only to new leases in the areas identified.

Other fluid mineral constraints, outside the contiguous BLM-administered habitat block, intended to protect resource values under Alternative B1 are the same as those listed for Alternative B. The NSO constraint for fluid minerals within contiguous BLM-administered surface under Alternative B1 is expected to have fewer adverse impacts on oil and gas development than Alternative B, but more than Alternatives A, C, and D.

Alternative B1 projects 113 federally permitted CBNG wells and 455 other federal oil and gas wells will be drilled on federal mineral estate in the planning area between 2001 and 2020 (Table 4-8). Of these wells, the RFD estimates there will be 96 productive CBNG wells and 387 productive oil and gas wells, resulting in a 57 percent decrease in producing CBNG wells and a 52 percent decrease in other producing wells compared to the unconstrained baseline projection. Operators will have to drill CBNG and conventional wells directionally or horizontally in order to extract fluid minerals from leases with NSO stipulations. Adverse impacts to oil and gas development under Alternative B1 are greater than under Alternative A and less than under Alternative B.

1.2.1.3 Conclusion

Acres administratively unavailable for oil and gas leasing are lowest under alternatives A and C and highest under Alternative B. The area of potential new leases subject to NSO restrictions for fluid minerals, timing, and (or) surface-disturbance restrictions is highest under Alternative B1 and lowest under alternatives A and C. The number of producing wells expected is highest under alternatives A, C, and D and lowest under Alternative B. Overall, Alternative A will result in the least potential adverse impacts, followed by alternatives C, D, and B1. Conversely, Alternative B will result in the most adverse impacts to new oil and gas leasing, exploration, and development.

1.3 Biological Resources

Habitat Fragmentation and Biological Diversity

To minimize habitat fragmentation, large blocks of contiguous habitats with low oil and gas development potential have been identified in the planning area and given special protection under Alternative B1. These contiguous habitat blocks would be administratively unavailable for new fluid mineral leases under Alternative B, and have an NSO stipulation for new leases under Alternative B1. Large, contiguous blocks of habitat have been identified as having higher habitat value for wildlife species, especially wide-ranging species (e.g., mule deer and pronghorn) and special status species that may depend on lower disturbance levels for breeding success (e.g., sage-grouse). In the planning area, many of these parcels and both public and private lands surrounding contiguous blocks, have previously been leased for mineral development. Habitat present in and around the blocks has been fragmented with access roads, pipelines, powerlines, well pads, and other oil and gas facilities from past mineral development. Currently leased areas would continue to be developed under all alternatives. Wildlife species that use the areas are accustomed to some level of disturbance from related activities and vehicle traffic. The BLM saw the need to reduce the increase in such habitat fragmentation and wildlife disturbance as would occur under Alternative A with no new restrictions.

Under Alternative B1, operators that want to access minerals on new leases beneath NSO areas would likely concentrate development on leased private and public lands at the edges of contiguous blocks and use some form of directional drilling. This concentrated development may occur in addition to development that already exists on edges of contiguous habitat. Actual levels of development expected to occur on public lands depend upon mineral occurrence potential, and feasibility of technical and economic development (refer to the Socio-Economic section and appendices M and S). Technical and economical feasibility of directional drilling was analyzed at 1, 2 and 3 mile distances from identified contiguous blocks of habitats. In most cases, it was determined that horizontal drilling was only feasible up to one mile of the surface location of mineral reserves (Appendix S). Under Alternative B, identified contiguous blocks would not be available for new fluid mineral leasing, thereby not increasing the development likely on the edges of this habitat as under Alternative B1. At the RMP level of analysis, estimates of development occurrence can only be qualitative, as is also true for impact analyses to biological resources. Potential effects to specific habitat types and wildlife species from contiguous block stipulations are discussed in those sections below (Vegetation, and Fish and Wildlife Resources – Wildlife).

1.3.1 Vegetation – Forests, Woodlands, and Forest Products

Surface-disturbing Activities. Compared to Alternative A, the NSO restriction to protect contiguous habitat blocks in Alternative B1 affects several forested areas by protecting them from surface-disturbing development that would otherwise occur on public lands newly leased within the blocks. Lands within the blocks that are already leased and lands outside the NSO parcels that are leased may be developed according to the terms of the existing lease. As discussed under Habitat Fragmentation and Biological Diversity, it is possible that operators wanting to access fluid minerals under the NSO lands would concentrate development on edges of forested contiguous blocks. This could have the effect of creating an “island” of the forested block if development around the perimeter included removal of mature trees. Compared to Alternative B, this edge development may reduce the habitat viability of the forested parcel if access or connections to other similar blocks is inhibited for species that utilize these habitats.

Proactive Management Actions. Contiguous habitat blocks were identified for protection in forested areas, focusing on those forests containing aspen communities (refer to Map 21 in Volume 2). Most management activities discussed under Alternative B are also proposed for Alternative B1. Under Alternative B1, there would likely be more oil and gas drilling activity and surface disturbance occurring on the edges of habitat blocks than under Alternative B, which is administratively unavailable for oil and gas leasing in contiguous habitat blocks. However, Alternative B1 provides more protection for forest resources compared to alternatives A and C.

1.3.2 Vegetation – Grassland and Shrubland Communities

Surface-disturbing Activities. Under Alternative B1, conservation of grassland and shrubland habitats, especially sagebrush and mountain shrub communities, is the primary focus of the contiguous block and NSO restrictions (Map 21). As compared with Alternative A where no such restriction occurs, the effects of an NSO restriction on the vegetation types within a contiguous block would be beneficial as new leases would not include oil and gas surface facilities within the block, and, therefore, less surface disturbance would occur. As discussed under Habitat Fragmentation, contractors wanting to access minerals under the NSO areas would likely concentrate development on public and private leases on edges of grassland and shrubland contiguous habitat blocks. The likely concentrated development that may occur around the edges of contiguous blocks would not affect the vegetation composition, vigor, or succession within the block. In some cases, the use of horizontal drilling may necessitate the need for fewer wellbores in an area, thereby disturbing less surface vegetation than in areas with different restrictions (Appendix S). Even so, there would likely be more drilling activity and surface disturbance occurring around contiguous habitat blocks than compared with Alternative B, which protects the blocks as administratively unavailable.

Impacts that may occur include that grassland and shrubland habitats within contiguous blocks may be utilized less by various wide-ranging or migrating wildlife species if access to blocks is hindered by increased edge development (refer to the Fish and Wildlife Resources – Wildlife section). This may have an effect on vegetation community vigor, composition, fecundity (e.g., seed-dispersal), and (or) diversity.

Proactive Management Actions. Even though grassland and shrubland communities within the contiguous habitat blocks are protected by an NSO restriction under Alternative B1, the vegetation resources on the edges of the contiguous blocks may be impacted more as increased drilling could occur there to access minerals below blocks. This alternative would protect less land area than Alternative B, which has the administratively unavailable restriction that includes no access to the unleased potential minerals below contiguous blocks, effectively protecting the vegetation resources on the edges of the contiguous blocks as well. Alternative B1 would protect the second greatest number of acres of grassland/shrubland habitat of the alternatives, Alternative B the greatest, and alternatives A and C would protect a similar number of acres. Alternative B1 would allow more access to mineral leasing, exploration, and development, more than Alternative B.

1.3.3 Vegetation – Riparian and Wetland Communities

Surface-disturbing Activities. Under the contiguous block NSO restriction, riparian and wetland habitats that occur within designated blocks would be protected from the surface disturbance of fluid mineral exploration and development, similar to under Alternative B. Impacts from increased edge development may occur as operators concentrate activities on block edges to access minerals below the blocks. Increased development activity may lead to increased surface disturbance that could contribute to more sedimentation and contaminants entering into riparian and wetland communities that flow into contiguous blocks.

Proactive Management Actions. The NSO restrictions under Alternative B1 would be expected to protect riparian and wetland communities within contiguous blocks similar to the administratively unavailable designation under Alternative B, and more than under alternatives A and C. In addition, the protections for streams and floodplains applied throughout the planning area under all alternatives would prevent direct impacts to riparian areas and wetlands.

1.3.4 Fish and Wildlife Resources – Wildlife

Surface-disturbing Activities. Management actions under Alternative B1 are similar to Alternative B for most wildlife species. As described for Vegetation Communities, however, the consequences of NSO restrictions on a contiguous block habitat under this alternative may afford protection for the vegetation and riparian resources within the habitat block but increase the likelihood that development would concentrate around its edges. This would reduce the quantity and quality of the wildlife habitat available around contiguous block edges, and potentially affect wildlife corridors or connections to the adjacent valuable contiguous habitats. For wildlife, especially wide-ranging or migrating species, the potential increase in surface disturbing activity around edges of valuable habitat blocks may reduce access to the blocks for these species. For smaller-ranging species that reside within the contiguous blocks, there is the potential that access for individuals into and out of the block would be inhibited by increased edge development, which could reduce genetic exchange with other habitat blocks and, potentially, decrease population viability. In effect, increased edge development would reduce the value of large contiguous blocks of habitat for wildlife if the connections and access to other similar areas are restricted or eliminated.

Wildlife-disturbing Activities. The potential increase in development activity that may occur around edges of valuable habitat blocks with NSO restrictions can contribute to increased noise and human presence. For wildlife, especially disturbance-sensitive species, this activity could potentially reduce access to the blocks for these species. If the contiguous block habitat is used for breeding by certain wildlife species, reduced or restricted access has the potential to affect breeding opportunities or success for those species. Depending on the size of the block and how close the increased edge development is, additional noise and human disturbance may affect breeding success within the block, especially for birds that rely on aural cues. Alternative B1 may contribute to wildlife-disturbing activities more than Alternative B, which essentially protects larger blocks of land from disturbance within and around contiguous habitat blocks by allowing no fluid mineral development on new leases.

Proactive Management Actions. Contiguous blocks of habitat were identified and surface facilities restricted under Alternative B1, which affords additional protection for the blocks compared to alternatives A and C. The NSO restriction applied to this alternative would protect resources within the block, but allows access to minerals from block edges. Compared to other alternatives, Alternative B1 would have the second greatest benefits for wildlife species; Alternative B would have the greatest benefits because it would protect the contiguous blocks and surrounding lands better than other alternatives.

1.3.5 Special Status Species – Wildlife

Large, contiguous blocks of habitat have been identified as having higher habitat value for wildlife species, especially wide-ranging species (e.g., mule deer and pronghorn) and special status species that may depend on lower disturbance levels for breeding success (e.g., sage-grouse). In the planning area, many of these areas and both public and private lands surrounding contiguous blocks have previously been leased for mineral development. Management actions under Alternative B1 are similar to Alternative B for most special status wildlife species. As described for Vegetation Communities, the consequences of NSO restrictions on a contiguous block habitat under this alternative may afford protection for the vegetation and riparian resources within the habitat block but increase the likelihood that development would concentrate around its edges. This would reduce the quantity and quality of the wildlife habitat available around contiguous block edges, and potentially affect wildlife corridors or connections to the adjacent valuable contiguous habitats. For wildlife, especially wide-ranging or migrating special status species, the potential increase in surface disturbing activity around edges of valuable habitat blocks may reduce access to the blocks for these species. For smaller-ranging species that reside within the contiguous blocks, there is the potential that access for individuals into and out of the block would be inhibited by increased edge development, which could reduce genetic exchange with other habitat blocks and, potentially, decrease population viability. In effect, increased edge development would reduce the value of large contiguous blocks of habitat for special status wildlife if the connections and access to other similar parcels are restricted or eliminated.

Wildlife-disturbing Activities. The potential increase in development activity that may occur around edges of valuable habitat blocks with NSO restrictions can contribute to increased noise and human presence. Especially for disturbance-sensitive species such as sage-grouse, this activity could potentially reduce access to the blocks for these species. If the contiguous block habitat is used for breeding by special status species, reduced or restricted access has the potential to affect breeding opportunities or success for those species. Depending on the size of the block and how close the increased edge development is, additional noise and human disturbance may affect breeding success within the block, especially for birds that rely on aural cues. Alternative B1 may contribute to wildlife-disturbing activities more than Alternative B, which allows no increased development around contiguous habitat blocks and essentially protects larger blocks of land from disturbance.

Proactive Management Actions. Contiguous blocks of habitat were identified and surface facilities restricted under Alternative B1, which affords additional protection for the blocks compared to alternatives A and C. The NSO restriction applied to this alternative would protect resources within the blocks, some of which provide habitat for special status species, but allow access to minerals from block edges. Compared to other alternatives, Alternative B1 would have the second greatest benefits for special status wildlife species; Alternative B would have the greatest benefits because it would protect the contiguous blocks and surrounding lands better than other alternatives.

Invasive Non-native Species (INNS)

Under Alternative B1, the primary focus is to conserve the identified contiguous habitat blocks using NSO restrictions. As compared with Alternative A where contiguous blocks were not identified, the effects of an NSO restriction under Alternative B1 would be beneficial for vegetation communities as new leases would not allow oil and gas drilling and surface facilities within the block, and, therefore, less surface disturbance would occur. When native soils and vegetation cover are left undisturbed, the opportunity for INNS invasion and establishment is reduced. Because operators may access the fluid minerals below the NSO areas under Alternative B1, it is likely that concentrated development may occur around the edges of contiguous blocks. This would increase the chance of INNS introduction and spread on the edges of contiguous blocks and provide a seed source for weed invasion into the blocks. Alternative B1 would provide more protection for vegetation resources and less opportunity for INNS spread than alternatives A and C, but less protection than under Alternative B.

1.4 Special Designations

Rock Creek/Tunp Management Area (Proposed)

Management of Rock Creek/Tunp Management Area (MA) under Alternative B1 includes the objective of preserving and enhancing the critical wildlife habitats and cultural values that occur within the area, as under Alternative B. Unlike Alternative B where the MA would be administratively unavailable for new fluid mineral leases, Alternative B1 applies an NSO stipulation for new fluid mineral leases. These protections are not included under Alternative A and would benefit the natural and cultural resources that occur in the Rock Creek/Tunp MA. Conversely, less restrictions on leasing, exploration and development under Alternative A would occur in the MA compared to alternatives B and B1, which benefits resource uses.

Rock Creek/Tunp MA protection measures included under Alternative B1 that differ from Alternative B include that closure of the area would only be for solid minerals, not all minerals as under Alternative B, and new and reissued fluid mineral leasing is allowed with NSO restrictions. Under Alternative B1, as described under Biological Resources, operators that want to access minerals on new leases beneath NSO areas would likely concentrate development on private and leased public lands at the edges of NSO areas and use some form of directional drilling. This concentrated development may occur in addition to development that already exists on edges of these areas and may have an adverse effect on the protection of resources identified for the MA (see Vegetation and Wildlife sections).

Also, new ROW actions are allowed in existing disturbance zones under Alternative B1, not only within existing utility corridors as under Alternative B More road development and surface disturbance than under Alternative B may be allowed under Alternative B1 as long as no net loss of habitat function occurs. Successful reestablishment or improvement of habitats could offset any new disturbance areas under this alternative.

Other restrictions on mineral material sales, withdrawals from locatable mineral entry, new high-profile structures, OHVs, AUM use, salt licks, and INNS; protections for NHTs; road reclamation; and plant community and wildlife habitat objectives are the same as under Alternative B.

Overall, more surface disturbance is allowed under Alternative B1 than under Alternative B, which can have adverse effects on resource values in the MA in the form of vegetation loss, wildlife habitat fragmentation, soil surface disruption, increased opportunity for INNS invasion, and loss of grazing AUMs. Alternative B1, however, would provide more natural and cultural resource protection than alternatives A and C. Alterative B1 would also make available more areas for new fluid mineral leasing, exploration, and development than Alternative B, benefiting resource uses.

Bear River Divide Management Area (Proposed)

Management of the Bear River Divide MA under Alternative B1 includes the objective of preserving and enhancing the critical wildlife habitats and cultural values that occur within the area, as under Alternative B. As under Alternative B, protection measures implemented under Alternative B1 for the MA include that the area would be administratively unavailable for solid mineral leasing for the life of the plan, but unlike Alternative B, allow new fluid mineral leasing and reissued leases with an NSO restriction within the northern portion of the MA. This could have the effect of allowing concentrated mineral development on leases that occur on the edges for access to minerals under the MA, as described for contiguous blocks of habitat with NSO (Biological Resources section).

Actions that are the same under Alternative B1 as under Alternative B include reclamation of existing roads, OHV travel restrictions, no wind-power facilities are authorized, NHT management, and development of plant community and wildlife habitat objectives.

Overall, Alternative B1 would result in less protection for the natural resource and cultural values identified in the Bear River Divide MA compared to Alternative B. However, Alternative B1 would provide more protections for these resources than under alternatives A and C. Alterative B1 would also make available more areas for new fluid mineral leasing, exploration, and development than Alternative B, benefiting resource uses.

1.5 Socioeconomic Resources

1.5.1 Social Conditions

Social impacts under Alternative B1 would be nearly identical to those under Alternative B, as described in the subsections below.

Impacts on Population

The impacts of Alternative B1 would be nearly identical to those of Alternative B. Activities on BLM-administered surface land and federal mineral estate in this alternative related to oil and gas, recreation, and livestock grazing would support an average of 657 to 674 jobs per year, which represents about 1.4 percent of total employment in the planning area as of 2004 (compared to 1.3 percent for Alternative B and 2 percent for Alternative A). Thus, compared to Alternative A, this represents a decrease in employment opportunities amounting to about 0.6 percent of 2004 employment, and compared to Alternative B this represents a small increase in employment opportunities (0.1 percent of 2004 employment). All of the decrease in employment opportunities compared to Alternative A would be in oil and gas; like Alternative B, Alternative B1 would result in a slight increase in livestock grazing-related jobs compared to Alternative A (about five jobs).

The decrease in job opportunities relative to Alternative A could result in a minor decrease in population. The reduction in job opportunities represents 0.6 percent of total 2004 employment; population could drop by a corresponding amount. However, population changes would not necessarily correlate perfectly with changes in employment opportunities, since population levels depend on numerous factors in addition to job opportunities: quality of life, quality of schools and other social services, home affordability, and comparisons relative to other communities, to name a few.

The relative contributions of each of the sectors analyzed in the IMPLAN model would be very similar to that for Alternative B; about 45 percent of the job opportunities would be related to oil and gas development and production, about 35 percent would be related to recreation, and about 20 percent would be related to livestock grazing. Because recreation and livestock grazing are dispersed over the planning area, and oil and gas development occurs in several different locations in the planning area, the jobs directly and indirectly related to these activities would be somewhat dispersed over the planning area as well. Despite the overall reduction in oil and gas job opportunities compared to Alternative A, there likely would be some concentration of job opportunities in population centers, including Kemmerer and Evanston. Depending on the pace of development, which is largely determined by forces other than BLM management actions, there may be short-term increases in population, which less densely populated towns or unincorporated small areas may be less able to absorb. However, the magnitude of these potential short-term increases would be smaller relative to under Alternative A; in addition, BLM's increased emphasis on collaborative management under this alternative (like Alternative B) may help to mitigate impacts related to the absorption of new population.

Impacts on Housing and Community Services

Changes in population also could change the demand for housing and community services, such as roads, schools, and police and fire protection, while changes in tax revenues due to mineral production could change the ability of communities to pay for community services. The annual average number of jobs predicted under this alternative may contribute to a slight decrease in demand for housing and community services compared to Alternative A, especially in cities and towns that house or support oil and gas workers (e.g., Kemmerer and Evanston). There would be a very small increase in demand for housing and community services compared to Alternative B. As noted in Chapter 4, if development occurs more slowly or more quickly than the relatively steady pace assumed in the analysis, there could be short-term impacts on demand for housing and community services, as well as on the supply of tax revenues from residences or businesses to support community services. It would likely be more difficult for smaller communities to absorb sudden changes of this nature.

In Alternative B1, impacts on demand for community services would be similar to those described for the housing stock; that is, there may be a slight decrease in demand for community services compared to Alternative A, and a very small increase in demand for community services compared to Alternative B. In addition, some areas may experience declining tax revenues due to a decrease in oil and gas activity compared to Alternative A, which could affect the communities' abilities to fund and provide community services. Tax revenues would be greater, however, compared to Alternative B. As in all of the alternatives, if national and international energy prices, operator business strategies, or other factors lead to a rapid pace of development, there could be sudden short-term increases in demand for community services as a result of new jobs and increased population.

Impacts on Custom, Culture, and Social Trends

Alternative B1 would provide for less economic development than Alternative A, but it would retain natural and rural conditions to a greater degree than Alternative A. Alternative B1 would indirectly impact the social well-being of communities in the planning area with restrictions on economic development via the use of resources. This alternative would continue BLM's current strategy of allowing multiple uses, but with more emphasis on resource protection. The differences compared to Alternative B in terms of impacts on custom, culture, and social trends would be minimal.

As indicated in the section on impacts common to all alternatives, the BLM would continue to incorporate socioeconomic considerations into the planning process and perform socioeconomic analyses as required for site-specific actions; under Alternative B1, the BLM would provide these analyses with the explicit goal of mitigating impacts through collaborative management, where possible (the same as in Alternative B). In addition, under Alternative B1 (again like Alternative B), the BLM would attempt to minimize the conflicts associated with mineral extraction, while stressing a balanced approach to diversify and enhance local economies, such as stressing the development of renewable energy and recreational opportunities. Thus, under this alternative, impacts on custom, culture, and social trends would tend to be reduced compared to Alternative A because of BLM's increased emphasis on collaborative management and the minimization of conflicts associated with mineral extraction.

The prohibition on leasing certain lands for oil and gas development in Alternative B would reduce economic activity attributable to oil and gas development on federal lands. However, the prohibition on leasing certain federal lands may lead indirectly to land use patterns on private and state lands that, in turn, could have secondary effects on custom and culture as related to land use. The development of directional wells from private and state surface land to tap reservoirs that underlie federal surface would be expected to result in an increased number of well pads on the edges of federal surface (but on state and private lands), which could include riparian areas (that otherwise provide excellent wildlife habitat) and large private ranches. While the decision to allow drilling from privately held ranch land may benefit individual operators, it would have effects on the surface landscape that are similar to the effects of development on federal lands (e.g., visual disturbance on otherwise relatively undisturbed expanses of rangeland).

1.5.2 Economic Conditions

The economic impacts of Alternative B1 were calculated based on the assumption that drilling costs for exploratory wells in Blocks A, B, and C (see map in Appendix S) is comparable to that for Overthrust Belt wells (i.e., about $2.4 million per well to drill; Table K-1). This assumption is based on the fact that the depths of most of the exploratory wells drilled in Blocks A, B, and C are close to that for Overthrust Belt wells (i.e., depths on the order of 11,000 feet; costs for Overthrust Belt wells are based on wells of 12,000 to 16,000 feet) and the increased cost associated with the use of horizontal and directional drilling techniques. (Using costs for 12,000 to 16,000 foot wells would generally overstate the costs for 11,000 foot wells, but the horizontal/directional techniques would increase costs, so the 12,000 to 16,000 foot well cost may apply better than the cost for a vertical 11,000 foot well.) Because the wells are exploratory, BLM did not predict the number of wells completed or the incremental production from these wells; therefore, for this analysis, economic impacts due to the expenditures to complete wells and impacts from production at these wells are discussed separately.

Impacts on Regional Earnings and Output

Based on the IMPLAN model, regional earnings under Alternative B1 would average between $17.0 and $17.4 million per year between 2001 and 2020 due to activities on BLM-administered surface lands and federal mineral estate (i.e., about $1.6 to $1.7 million higher than Alternative B). Although regional earnings under Alternative B1 amount to about three-fifths of the amount projected for Alternative A based on the activities analyzed in IMPLAN, the difference (about $10 to $11 million per year) amounts to just 0.4 percent of 2004 total personal income in the three-county socioeconomic study area; thus, the difference between alternatives A and B1 amounts to a relatively small portion of total earnings. The difference between alternatives B and B1, $1.6 to $1.7 million, amounts to about 0.1 percent of total regional earnings. Regional output would average $5.3 to $5.7 million per year more than Alternative B; that is, output would average between $212.9 and $214.2 million per year, with a net present value of between $1,907 and $1,919 million.

As indicated above in the discussion of assumptions for Alternative B1, the difference compared to Alternative B is based on only the anticipated increase in drilling activity in Blocks A, B, and C. For every well that is completed, the completion expenditures would increase average regional earnings by about $9,500, and would increase average regional output by about $28,000, over the 20-year forecast period; for every billion cubic feet of gas produced, annual average regional earnings would increase by about $0.2 million and annual average regional output would increase by about $6.5 million.

The impacts of Alternative B1 relative to earnings and output from recreation and livestock grazing would be identical to those of Alternative B. Effects on renewable energy development and the proposed building stone operation near the Bear River Divide MA would also be identical to those of Alternative B.

Impacts on Employment

Regional employment under Alternative B1 would average between 657 and 674 jobs per year (about 42 to 46 more than for Alternative B) between 2001 and 2020 due to activities on BLM-administered surface lands and federal mineral estate analyzed in the IMPLAN model. This number of jobs is about 70 percent of the level predicted for Alternative A (Table 4-16); the difference amounts to just 0.6 percent of the total employment in the three-county area in 2004 (47,414 jobs). Again, the difference compared to Alternative B is based on only the anticipated increase in drilling activity in Blocks A, B, and C. For every well that is completed, employment would rise minimally (less than one job), and for every billion cubic feet of gas produced, annual average employment would rise by about 4.5 jobs. Average annual earnings per job in Alternative B1 would be identical to those shown for alternatives A and B.

Impacts on Tax Revenue

As indicated above, BLM did not attempt to predict the completion rate or production parameters for the exploratory wells. For every additional billion cubic feet of gas produced from the exploratory wells, projected tax revenues from oil and gas production would average an additional $0.6 million per year for federal royalties, $0.3 million per year for state severance taxes and $0.3 million per year for local ad valorem tax receipts.

1.5.3 Environmental Justice

Like Alternative B, Alternative B1 would have no potential for disproportionate adverse impacts on minority and low-income populations, including direct, indirect, short-term, and long-term impacts. Based on demographic conditions in the planning area and the direct and indirect impacts of the alternatives, there would be no identifiable environmental justice issues or direct or indirect impacts associated with any of the alternatives specific to any minority or low-income community or population as defined in Executive Order (EO) 12898 or BLM IM 2002-164 (BLM 2002f). While minority and low-income populations exist in the planning area, no particular BLM actions proposed in any of the alternatives have been identified as causing disproportionate adverse impacts on these populations. The BLM has considered all input from persons regardless of their race, ethnicity, income status, or other social and economic characteristics.

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KEMMERER
PROPOSED RESOURCE MANAGEMENT PLAN AND
FINAL ENVIRONMENTAL IMPACT STATEMENT

Appendix R

Draft Resource Management Plan and Environmental Impact Statement Final Comment Analysis

Appendix R
Draft Resource Management Plan and Environmental Impact Statement Final Comment Analysis

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ACRONYMS AND ABBREVIATIONS

BLM	Bureau of Land Management
EIS	Environmental Impact Statement
NEPA	National Environmental Policy Act
NOA	Notice of Availability
RMP	Resource Management Plan
ROD	Record of Decision
WGFD	Wyoming Game and Fish Department

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1.0 INTRODUCTION

On July 13, 2007, the Bureau of Land Management (BLM) published a Notice of Availability (NOA) in the Federal Register announcing publication of the Kemmerer Field Office Draft Resource Management Plan and Environmental Impact Statement (Draft RMP/EIS). This NOA initiated the beginning of a 90-day public comment period. The BLM accepted comments on the Draft RMP/EIS between July 13, 2007 and October 11, 2007. During the 90-day public comment period, the BLM hosted two open houses and three public meetings within the Kemmerer planning area to gather comments on the Draft RMP/EIS and to answer questions from the public. This report provides a summary of public comments received on the Draft RMP/EIS during the 90-day comment period. During this period, the Kemmerer Field Office received 61 public responses, including letters, comment forms, and public meeting testimony. Three public response documents (from the Uinta County Citizens Coalition, Gary-Williams Production Company, and the Office of the Governor) were received after the close of the comment period and are not considered in this report. The individual comments in these public response documents were similar to other comments received within the public comment period and therefore, may have already been addressed.

Although this report attempts to capture the full range of public issues and concerns, it should be used with caution. Respondents are self-selected; therefore, their comments do not necessarily represent the sentiments of the public as a whole. However, this summary does attempt to provide fair representation of the wide range of views submitted. In consideration of these views, it is important for the public and decision makers to understand that this process does not attempt to treat input as if it were a vote. Instead, the comment analysis process ensures that every comment is considered at some point in the decision process.

The remainder of this report is organized as follows:

- **Content Analysis Process** – Describes how the BLM receives, records, and categorizes response documents and comments.
- **Summary of Public Responses to the Draft RMP/EIS** – Provides an overview of response document demographics.
- **Analysis of Comments** – Outlines the parameters for substantive and non-substantive comments and provides a brief summary of comments and responses.
- **Appendix A: Public Response User's Guide** – A user's guide to assist respondents in identifying their response document, comments, and how the BLM responded.
- **Appendix B: Public Response Documents** – Copies of all response documents are included in this appendix.
- **Appendix C: Individual Comments and Responses** – Includes a table of individual comments and BLM responses organized by response document number, comment number, and summary comment number. Respondents can use the guide in Appendix A to identify their response document.

2.0 CONTENT ANALYSIS PROCESS

Comment content analysis for this document is defined as a systematic method of compiling, categorizing, and evaluating written comments made by individuals, federal and state agencies, Tribal governments, elected representatives, and other organizations on the Draft RMP/EIS in order to identify substantive issues for review and response by the BLM decision makers. Additionally, through the content analysis process, BLM supplemented the project mailing list of respondents and compiled demographic information on the geographic distribution of respondents (see Section 3 of this report).

Public responses include oral testimony given at the public meetings and written responses postmarked or received via the project website within the 90-day public comment period. Methods of receiving responses included U.S. mail, e-mail, website submittals, and public meetings. All individuals attending public meetings were encouraged to submit responses in writing. Note that a public response document refers to the written submission or oral testimony from a respondent (e.g., letter, e-mail, etc.), whereas a comment refers to an identifiable expression of interest or issue statement included within a public response document. For example, a letter (i.e., public response document) received within the public comment period may contain one or more identifiable comments.

Analysis Process

Upon receipt of a public response, a member of the comment analysis team logged the response into a register, assigned a unique identifier, and converted the response to a searchable electronic (i.e., PDF) document. A team member then entered all pertinent respondent metadata (e.g., name, affiliation, address, and type of response) into a spreadsheet.

The first step in the analysis process is to identify and code individual comments within a public response. In accordance with the BLM's National Environmental Policy Act (NEPA) Handbook (H-1790-1), the team categorized each individual comment as substantive or non-substantive and assigned a numerical code to identify the type of comment as listed below. Comments that fall into categories 1 through 4 are considered substantive comments whereas categories 5 and 6 are non-substantive.

1. Comments on Inaccuracies and Discrepancies
2. Comments on the Adequacy of the Analysis
3. Comments Which Identify New Impacts, Alternatives, or Mitigation Measures
4. Disagreements With Significance Determinations
5. Personal Preferences
6. Other: Beyond the scope of this RMP/EIS, request for mailing list or copy of document, etc.

The team further categorized each comment by the topic that most closely captured the comment intent (e.g., Air Quality, Special Designations, Alternative A). The topics identified during this step of the process are shown in Table 2-1. Once all comments were coded, the BLM Interdisciplinary Team provided individual responses to all substantive comments. The comment analysis team then used the individual comments and responses to analyze, group, and summarize comments, and to write responses to summary comments.

The results of the comment analysis process are included in the appendices of this document. Appendix A includes a user's guide to assist respondents in finding their response documents and comments, Appendix B includes copies of all response documents, and Appendix C presents all individual comments, their associated codes, and individual responses.

Table 2-1. Comment Topics

Description	Description	Description
Implementation	Short-Term vs. Long-Term Productivity/Risks	Other Management Areas
Mitigation Measures	Multiple Physical Resources Management	National Historic Trails
Definition of Terms	Soils and Geology	Heritage and Visual Resource Management
Cumulative Impacts	Water Resources	Historic Resources
Appendices	Air Quality	Paleontological Resources
Out of Scope	Noise	Multiple Natural Resource/Management Activities
Mailing List/Copy DEIS	Visual Resources Management	Multiple Use Management
Editorial Corrections	Climate, Weather, and Atmospheric Processes	Ecosystem Management
Purpose and Need for Proposed Action	Biological Elements Management, General	Monitoring and Evaluation
Industry/Business Groups	Ecosystem/Habitat Composition and Function	Forested Vegetation Management
Public Involvement	Grassland/Shrubland	Late Successional/Old Growth
Outreach/Agency Communication Efforts	Riparian	Forest Health Management
Use of Public Involvement/Comment	Wildlife Management General	Noxious Weeds
Extension Needed	Wildlife Population Management	Insects and Disease
Collaboration with Other Government Entities	Terrestrial Wildlife and Habitat	Use of Pesticides and Herbicides
Other Federal Agencies	Fisheries and Aquatic Wildlife	Fire Management
State or Local Governments/Officials	Special Status Species (wildlife)	Role of Fire in Ecosystems
Relation to or Consistency with Other Plans, Directives, Etc.	Wildlife Structures	Prescribed Fire
Agency Rules and Regulations	Special Status Species (vegetation)	Domestic Livestock Management
Rules of Other Agencies	Transportation System Management (Infrastructure)	Livestock Grazing
Use of Science In Decision Making General	Roads Analysis	Fences, Water Troughs, Facilities
Best Available Science	Roads Infrastructure Management General	Mineral Resources Management
Funding, General	Motorized Routes	Leasable (Oil, Gas)
Funding for Implementation of Proposed Action	User-Created Roads and Trails	Directional Drilling
Alternatives General	General/Multiple Access	Leasable (Coal)
Alternative Development/Range	Recreation Management General	Locatable (Hardrock)
Alternative A	Motorized Recreation and Access General	Salable (Gravel, Rock, Etc.)
Alternative B	Mechanized Recreation	Communication Sites And Facilities
Alternative C	Non-Motorized, Non-Mechanized Recreation	Utility Corridors
Alternative D	Landownership	Utility Access and Rights-Of-Way

Table 2-1. Comment Topics (Continued)

Description	Description	Description
Relation to Laws, Act, Policies General	Land Exchanges and Disposal	Renewable/Wind Energy
Federal Laws, Acts, and Policies	Rights-Of-Way	Social Values Management (Includes Socio-Economic General)
NEPA	Special Land Designations General	Public Health And Safety
FLPMA	Other Special Designations	Economic Values Management
State Laws, Acts, and Policies	Wild and Scenic Rivers	Economic Contribution/Role of Agency-Administered Lands
Environmental Management General	Areas of Critical Environmental Concern	Local/Regional
Managing Ecosystem Integrity	Wilderness Study Areas	Tax Base and Payments to States

3.0 SUMMARY OF PUBLIC RESPONSES TO THE DRAFT RMP/EIS

This section provides a summary of the response demographics. Demographic analysis allows the BLM to form an overall picture of issues, as well as better understanding of who is submitting comments, the geographic distribution of respondents, their affiliations, and the format of the public responses.

The demographics presented below are based on public response documents received during the 90-day comment period. Note that separate comments are not treated as votes, and the outcome is not determined by a majority opinion. Every comment is considered individually. While demographic information can provide insight into public concerns, the comments are not a random representative sample of public opinion; therefore, the demographics presented in this report do not necessarily represent the opinions of society as a whole.

Geographic Representation

Geographic representation is tracked for each public response document received during the course of the public comment period. Table 3-1 identifies the origin of respondents filtered to the city and state of the respondent.

Table 3-1. Geographic Representation of Respondents

City	State	Number of Respondents
Oakland	California	1
San Diego	California	1
Boulder	Colorado	1
Denver	Colorado	8
Longmont	Colorado	1
Wilmington	Delaware	1
Idaho Falls	Idaho	1
Independence	Missouri	1

Table 3-1. Geographic Representation of Respondents (Continued)

City	State	Number of Respondents
Portland	Oregon	1
Logan	Utah	1
Provo	Utah	1
Salt Lake City	Utah	2
Washington D.C.	Washington D.C.	1
Casper	Wyoming	3
Cheyenne	Wyoming	5
Cokeville	Wyoming	2
Diamondville	Wyoming	1
Evanston	Wyoming	5
Jackson	Wyoming	1
Kemmerer	Wyoming	6
Laramie	Wyoming	3
Lonetree	Wyoming	1
Lyman	Wyoming	7
Unknown	Unknown	6

Organizational Affiliation

The BLM received responses from various organizations and unaffiliated individuals including local governments, preservation/conservation organizations, private industry, and unaffiliated individuals (Table 3-2). Only those public responses received on official letterhead, received through an official e-mail address, or announced during public testimony are considered as affiliated with an organization or government entity. All others are classified as unaffiliated individuals. Organization types were tracked for each comment document.

Table 3-2. Number of Responses per Affiliation

Affiliation	Number of Public Response Documents
Federal Agency	4
State Agency	6
Local Government	6
Non Governmental Organization	9
Private Industry	15
Unaffiliated Individual	21

Public Response Document Format and Method of Delivery

BLM received public response documents in various formats and through a variety of delivery systems. Table 3-3 identifies the number of documents received by format (e.g., e-mail, letter, website). All public response documents received were unique; no form letter responses were received during 90-day comment period.

Table 3-3. Number of Public Response Documents by Format

Response Document Format	Number
E-mail	3
Website	7
E-mail with a letter attached	5
Letter	36
Postcard	0
Comment Form	5
Public Hearing Testimony	5
Total	**61**

4.0 ANALYSIS OF COMMENTS

The BLM received 61 public responses to the NOA for the Kemmerer Draft RMP/EIS during the 90-day comment period. This section describes the categories of comments, summarizes like comments, and provides responses to comments. The 61 public responses received contained substantive and non-substantive comments. Representative non-substantive comments include requests to be added to the project mailing list, requests for a copy of the Draft RMP/EIS, personal preference or opinion, and comments which are outside the scope of the Draft RMP/EIS. Representative substantive comments generally relate to accuracy or adequacy of the analysis.

In accordance with the BLM's NEPA Handbook (H-1790-1), comments received on the Draft RMP/EIS are addressed in this report if they "are substantive and relate to inadequacies or inaccuracies in the analysis or methodologies used; identify new impacts or recommend reasonable new alternatives or mitigation measures; or involve substantive disagreements on interpretations of significance" (See 40 Code of Federal Regulation 1502.19, 1503.3, 1503.4, 1506.6, and 516 DM 4.17).

BLM's NEPA Handbook (H-1790-1) identifies the following examples of comment categories and appropriate responses (listed in Section 2.0 of this report).

- **Comments on Inaccuracies and Discrepancies**. Factual corrections should be made in the EIS in response to comments that identify inaccuracies or discrepancies in factual information, data, or analysis.

- **Comments on the Adequacy of the Analysis**. Comments that express a professional disagreement with the conclusions of the analysis or assert that the analysis is inadequate may or may not lead to changes in the EIS. Interpretations of analyses should be based on professional expertise. Where there is disagreement within a professional discipline, a careful review of the various interpretations is warranted. In some cases, public comments may necessitate a reevaluation of analytical conclusions. If, after reevaluation, the manager responsible for preparing the EIS does not think that a change is warranted, the response should provide the rationale for that conclusion.

- **Comments That Identify New Impacts, Alternatives, or Mitigation Measures**. If public comments on a draft EIS identify impacts, alternatives, or mitigation measures that were not addressed in the draft, the manager responsible for preparing the EIS should determine if they warrant further consideration. If they do, that official must determine whether the new impacts, new alternatives, or new mitigation measures should be analyzed in either: the final EIS; a supplement to the draft EIS; or a completely revised and recirculated draft EIS.

- **Disagreements with Significance Determinations**. Comments may directly or indirectly question determinations regarding the significance or severity of impacts. A reevaluation of these determinations may be warranted and may lead to changes in the EIS. If, after reevaluation, the manager responsible for preparing the EIS does not think that a change is warranted, the response should provide the rationale for that conclusion.

- **Expressions of Personal Preferences**. Comments that express personal preferences or opinions on the proposal do not require further agency action. They are summarized whenever possible and brought to the attention of the manager responsible for preparing the EIS. Although personal preferences and opinions may influence the final selection of the agency's preferred action, they generally will not affect the analysis.

- **Other**. In addition to the 5 categories from the NEPA Handbook described above, a sixth category named “other” was added for this report. Requests for copies of the Draft RMP/EIS, requests to be added to the project mailing list, and comments that are outside the scope of the project are classified as “other” comments. These comments are considered non-substantive and do not require further agency action.

A total of 1,522 individual comments were identified in the 61 response documents. Of these 1,522 comments, 934 comments were identified as substantive. Individual comments and agency responses are provided in Appendix C of this document. However, in an effort to provide a user-friendly method of understanding the broad themes or topics of concern expressed in the comments, the analysis team grouped individual comments with similar concerns and developed 24 summary comments and responses. The 24 summary comments and responses are presented below, and generally are organized by BLM resource program and other applicable categories (e.g., purpose and need). A summary comment that addresses several resource programs is listed under the heading Multiple Resource Programs.

PURPOSE AND NEED

Summary Comment #17: Respondents raised questions or requested clarification on the purpose and need as written for the Draft RMP/EIS as it relates to mineral resources.

Summary Response: As stated on Page 1-5, new data have become available, new policies have been established, and old policies have been revised. This, along with emerging issues and changing circumstances, resulted in the need to revise the existing plan. This section is not arguing that energy minerals development has become the priority use on public land. Rather, the Energy Policy and Conservation Act Reauthorization of 2000 coupled with the Nation's growing demand for domestic energy is simply listed as an example of the many emerging issues and changing circumstances resulting in the need to revise the existing plan. See Page 1-5, New Data; Page 1-6 New and Revised Policy, and Page 1-7 Emerging Issues and Changing Circumstances.

AIR QUALITY

Summary Comment #1: A number of respondents submitted comments requesting a change, alteration or clarification of air quality (analysis, management action, or mitigation measure) or requested additional information.

Summary Response: The inter-agency air quality team (including air quality staff from Wyoming Department of Environmental Quality [Air Quality Division], U.S. Environmental Protection Agency, U.S. Forest Service, National Park Service, and BLM) collaborated on the "emissions-based" method used for the KFO RMP/EIS. Quantitative air quality analysis will be performed at the project level as necessary. BLM recognizes the primacy of the State of Wyoming in regulating air quality. Emission factors and parameters will be revised as necessary.

Summary Comment #24: A few of respondents submitted comments requesting a change, alteration or clarification concerning climate change/global warming (analysis, management action, or mitigation measure) or requested additional information.

Summary Response: Text regarding climate change/global warming has been added to the document where appropriate. The BLM Washington Office is currently in the process of preparing guidance to address the issue of climate change/global warming. However, this guidance has not been finalized, and thus does not appear in the Draft RMP/EIS. Once finalized, the Kemmerer Field will adhere to all applicable guidance.

SOIL and GEOLOGY

Summary Comment #19: Numerous respondents requested change, alteration, or clarification of soil or geology (analysis, management action, mitigation measure) or requested additional information regarding geologic hazards.

Summary Response: Mitigation measures protecting soil and geology resources were based on the best available information as referenced in Chapter 5 and federal laws, regulations, policies, and guidance. If needed, project level analysis will provide additional information. In most cases, the site-specific impacts will be identified during onsite reviews and will be analyzed in environmental documents pertaining to the specific action. Additional information or clarification will be provided in the Proposed RMP and Final EIS where appropriate.

WATER

Summary Comment #2: Numerous respondents requested change, alteration, or clarification of water resources (analysis, management action, mitigation measure) or requested additional information regarding water resources.

Summary Response: Mitigation measures protecting water resources were based on the best available information as referenced in Chapter 5 and federal laws, regulations, policies, and guidance. The BLM coordinates with the appropriate regulatory authority responsible for water quality in Wyoming (i.e., Wyoming DEQ).

MINERAL RESOURCES

Summary Comment #3: Respondents requested change, alteration, or clarification of salable and leasable minerals (analysis, management action, mitigation measure) or requested additional information regarding salable and (or) leasable minerals.

Summary Response: The Reasonable Foreseeable Development was the base document used for analysis of salable and leasable minerals in the Draft RMP/EIS. The document can be found at http://www.blm.gov/rmp/kemmerer/. Additional information or clarification will be provided in the Proposed RMP and Final EIS where necessary.

VEGETATION

Summary Comment #4: Respondents submitted requests to set standards, verify effectiveness of management activities, or clarify information regarding vegetation in the planning area.

Summary Response: The preferred alternative identifies a wide range of management actions to protect important habitat types throughout the planning area. A variety of tools, including fire, are used to meet habitat objectives. In addition, contiguous vegetation blocks were identified to manage further fragmentation of large, contiguous blocks of native habitat. Habitats are assessed by BLM and the Wyoming Game and Fish Department (WGFD) to determine if their condition supports wildlife objectives.

FISH AND WILDLIFE – WILDLIFE

Summary Comment #5: Some respondents commented on the need for additional information on big game, or clarification of potential discrepancies in alternatives or the analysis on big game.

Summary Response: The WGFD, a cooperator who participated in the preparation of the Draft RMP/EIS, is responsible for establishing herd objectives through a public process. Many of the management challenges to meeting herd objectives are outside BLM's authority to manage (i.e., intermingled land ownership, agricultural conversion, drought conditions, etc.). The BLM decided to produce mapping of all big game species combined because constraints are aligned with crucial winter range regardless of species. Moose, elk, pronghorn, and deer crucial winter range restrictions are in place from November 15 through April 30. The BLM will continue to consider your comment throughout the planning process.

SPECIAL STATUS SPECIES

Summary Comment #6: Numerous respondents requested a change, alteration, or clarification of special status species (analysis, management action, or mitigation measure), or they requested additional information regarding special status species.

Summary Response: This analysis considers numerous management actions to reduce indirect impacts to wildlife and wildlife habitat, including special status species. Mitigation measures protecting special status species were based on the best available information as referenced in Chapter 5 and federal laws, regulations, policies, and guidance. BLM maintains compliance with all federal laws and guidance.

HERITAGE RESOURCES

Summary Comment #21: Respondents expressed concern or requested additional information regarding cultural resources including National Historic Trails and (or) other historic resources.

Summary Response: Section 106 requires Federal agencies to take into account the effects of undertakings on historic properties and to accommodate historic preservation concerns through consultation among the agency and other parties with interests in historic properties potentially affected by undertakings. BLM completed a Class I Regional Overview prior to completion of the Draft RMP/EIS. Mitigation measures and management actions protecting heritage resources were based on the best available information as referenced in Chapter 5 and federal laws, regulations, policies, and guidance. BLM maintains compliance with all federal laws and guidance. The Proposed RMP and EIS will include additional clarification of National Historic Trails, including buffers and management levels.

LAND RESOURCES

Summary Comment #20: Respondents expressed concern or requested additional information regarding retention, disposal, exchange, or acquisition of land within the planning area.

Summary Response: The Kemmerer RMP revision undertakes to incorporate a land tenure adjustment strategy, in accordance with the Land Use Planning Handbook (H-1601-1), by specifically identifying all of the individual parcels potentially affected. Once identified in the RMP and as opportunities arise, these identified parcels can then be considered for adjustment using the available tools including sale, exchange, Recreation and Public Purposes, acquisition, withdrawal, etc. Prior to any action, site-specific analysis will be conducted and will consider public access and the natural and cultural resources on the land.

Summary Comment #9: Expression of interest in length of time it takes for completion of coordination processes of projects impacting BLM-administered lands (surface and mineral estate).

Summary Response: Any proposals for development on BLM-administered lands are subject to coordination and environmental review as appropriate and the review time varies with the project.

Summary Comment #10: Numerous respondents requested change, alteration, or clarification of livestock grazing management (utilization, management actions, mitigation measures) or requested additional information regarding livestock grazing. Some respondents expressed concern about an anti-livestock bias in the Draft RMP/EIS. Conversely, other commenters felt the prominence of grazing on public lands was too high.

Summary Response: The analysis considers numerous management actions to reduce impacts to livestock grazing. Mitigation measures for livestock grazing were based on the best available information as referenced in Chapter 5 and federal laws, regulations, policies, and guidance. BLM maintains compliance with all federal laws and guidance. Appropriate text in the

Proposed RMP and Final EIS will include information addressing the importance of appropriate grazing management practices as related to rangeland health.

Summary Comment #8: Respondents requested clarification of the use or management of motorized and mechanized recreation or travel management in the planning area, including snowmobiles. Respondents also included requests to change, alter, or clarify motorized recreation and general access.

Summary Response: Travel management areas and travel planning criteria will be defined in the Proposed RMP and Final EIS. Travel management areas are identified for development of travel management plans within 5-10 years of signing the Record of Decision for the revised RMP. Your comments will be considered at that time. A number of referenced documents as well as updated BLM policy will be considered during this process so the most up-to-date scientific data are used.

Summary Comment #7: Respondents expressed concern or requested additional information regarding Visual Resource Management (VRM) classifications in the planning area.

Summary Response: The purpose of visual resource management is to manage the quality of the visual environment and to reduce the visual impact of development activities while maintaining the viability of all resource programs. The inventory included visual quality, distance zones, and sensitivity of the landscape. See BLM Manual Handbook 8410-1 and Washington Office Information Bulletin No. 98-135 for further guidance.

SPECIAL DESIGNATIONS

Summary Comment #22: Numerous respondents requested change, alteration, or clarification of special designations in the planning area (analysis, management action, mitigation measure) or requested additional information. Special designations include Areas of Critical Environmental Concern (ACECs), Research Natural Areas (RNAs), Wild and Scenic Rivers (WSRs), Wilderness Study Areas (WSAs), and Back Country Byways (BCBs).

Summary Response: A full range of alternatives were developed and considered. Special designations may constrain or encourage select resource uses in order to conserve resource values. Mitigation measures and management actions intended to protect resource values within special designation area boundaries were based on input from the public and the best available information as referenced in Chapter 5 and federal laws, regulations, policies, and guidance. The BLM will continue to consider you comment throughout the decision making process.

SOCIAL AND ECONOMIC CONDITIONS

Summary Comment #23: Respondents request a change, alteration, clarification, or broadening of the socio-economic impact analysis.

Summary Response: BLM recognizes the importance of quantifying non-market values when appropriate; however, this type of analysis is beyond the scope of this effort. BLM also recognizes the socio-economic impact/value of resources such as oil and gas is a function of where those resources are found. Estimates for social and economic impacts for the Draft RMP/EIS were analyzed using the best available data and applicable modeling methods.

MULTIPLE RESOURCE PROGRAMS

Summary Comment #11: Respondents submitted comments beyond the scope of the current document or expressed personal preference or opinion regarding alternatives, resources, or mitigation measures.

Summary Response: After review and careful consideration, the BLM has determined that your comment represents personal preference or opinion, or is outside the RMP's scope. Changes to the Kemmerer Draft RMP/EIS related to your comment will not be made at this time. The BLM will continue to consider your comment throughout the decision making process.

Summary Comment #12: Commenter requests a clarification of terminology, a correction in language or grammar, or a reevaluation of a section of text for accuracy.

Summary Response: Requests will be evaluated on an individual basis and text will be clarified or corrected as appropriate in the Proposed RMP and Final EIS.

Summary Comment #13: Some respondents requested verification that the recommendations set out in the document are in compliance with applicable laws, acts, regulations, policies, plans, directives, standards, or guidelines.

Summary Response: BLM complies with all applicable laws, policies, and regulations. All recommendations are taken into consideration and evaluated with relevant documents. Language and management actions will be reviewed and corrected, as appropriate, to ensure compliance with applicable laws, acts, regulations, policies, plans, directives, standards, or guidelines in the Proposed RMP and Final EIS. Lists of new and revised policies will be amended as appropriate for the Proposed RMP and Final EIS.

Summary Comment #14: Respondents requested the inclusion or adoption of additional baseline information (such as more data or a map); provisions or data from reports, guidelines, or recommendations; expressed concern over effectiveness of mitigation measures; or requested to implement specific mitigation measures.

Summary Response: BLM considered and incorporated baseline information including peer-reviewed, relevant scientific literature where applicable. Mitigation measures were based on the best available information and federal laws, regulations, policies, and guidance. A wide range of reasonable mitigation measures are included in each alternative as management actions, including measures suggested by individuals and organizations in their scoping comments. Upon completion of the Kemmerer RMP revision, an implementation strategy will be developed. This process occurs after the Record of Decision and is not a part of the Draft RMP/EIS. However, the BLM will continue to consider your comment throughout the decision making process.

Summary Comment #15: Respondents requested to broaden or alter the scope of the cumulative impacts analysis, range of alternatives, or requests to widen the overall scope of the EIS.

Summary Response: The Federal Land Policy and Management Act requires that BLM manage public lands and resources in accordance with the principles of multiple use and sustained yield, including recognizing the Nation's need for domestic sources of minerals, food, timber, and fiber. With that in mind, a full range of alternatives were developed and analyzed. BLM took extensive measures to ensure the scope, content, and analysis of cumulative impacts was thorough and appropriate for resources and resource uses potentially affected by the actions proposed in the document. However, the BLM will continue to consider your comment throughout the decision making process.

Summary Comment #16: Respondents requested change, alteration, or clarification of surface-disturbing activities (analysis, management action, mitigation measure), or requested additional information regarding surface-disturbing activities.

Summary Response: BLM strives to minimize all surface-disturbing activities. The preferred alternative minimizes activities on areas sensitive to surface disturbance. Appendix M discloses the amount of anticipated surface disturbance for each activity. Where avoidance is not possible, additional mitigation would be employed.

Summary Comment #18: Some respondents raised questions or requested clarification on the public participation/coordination process.

Summary Response: The BLM published the Notice of Intent in the Federal Register on June 16, 2003, and issued a scoping notice to initiate a 30 day scoping period for the purpose of informing potentially affected parties of the intent to revise the Kemmerer Field Office RMP/EIS and to solicit input regarding identification of potential issues and alternatives; however, the revision scoping period remained open for 5 months. The BLM appreciates your comments and will consider them during preparation of the Proposed RMP/Final EIS.

5.0 CONCLUSION

In summary, respondents voiced a range of concerns relative to the revision process and land management issues. The most frequently discussed topics in the public comments were special status species, mineral resources, and livestock grazing.

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DRAFT RESOURCE MANAGEMENT PLAN AND ENVIRONMENTAL IMPACT STATEMENT FINAL COMMENT ANALYSIS

APPENDIX A

Public Response User's Guide

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Appendix A – Public Response User's Guide

The tables presented in Appendix A are designed to assist respondents in determining how their comments were considered by BLM.

Table A-1 provides a list of respondents, the response document number, and the comment numbers associated with each public response document. Table A-2 (page A-4) identifies summary comments by comment number. To use these tables:

1. Locate your name and associated response document number and comment numbers in Table A-1.
2. Using the comment numbers from Table A-1, find your summary comment numbers in Table A-2.

With this information (Response Document Number, Comment Numbers, and Summary Comment Numbers), a respondent can locate a copy of their original document in Appendix B, their individual comments and agency responses in Appendix C, and the summary comment in Section 4 of the main document.

Table A-1. Public Response Index

Respondent Last Name	Respondent First Name	Respondent Affiliation	Response Document Number	Comment Number(s)
Alleman	Farrell	Individual	24	302-315
Azeka	Michael	AES Sea West	42	585-598
Barrett	Bruce	Bureau of Reclamation	31	348-352
Bates	Jennifer	Questar	57	1298-1302
Bennion	Sam	Individual	4	6-7
Binder	Joan	Wyoming State Geological Survey	18	209-212
Bown	Edward	Various Cattle Permittees	19	213-222
Broadbent	Joe	Individual	10	27
Brown	David	BP American Production Company	52	982-1062
Burg	Diane	Individual	7	15-18
Cattelan	Jeanie	Individual	1	1-3
Clark	Blake	Wyoming State Snowmobile Association	12	33-43
Clayson	Tom	Anadarko	32	353-381
Connelly	Kent	Coalition of Local Governments	50	754-976
Cooper	Stan	Wyoming State Senate	6	9-14
Corbett	Mary Lynn	Individual	2	4
Corbett	Mary Lynn	Individual	8	19-23
Corra	John	Wyoming Department of Environmental Quality	34	383-395
Coyle	Stewart	Individual	13	44

Table A-1. Public Response Index (Continued)

Respondent Last Name	Respondent First Name	Respondent Affiliation	Response Document Number	Comment Number(s)
Emmerich	John	Wyoming Game and Fish Department	14	45-106
Etchepare	John	Wyoming Department of Agriculture	30	335-347
France	Annette	Individual	43	599-604
Freudenthal	Dave	Office of the Governor (Wyoming)	40	570-576
Fujimoto	Shirley	Union Telephone Company	17	178-208
Hickey	Joe	Individual	23	295-301
Hickey	Joe	Uinta County Citizens Coalition for Sound Resource Use	22	270-294
Howard	Tim	Gary-Williams Production Company	41	577-584
Hubbard	Carla	Wyoming Pipeline Authority	48	722
Jaggi	Allen	Individual	3	5
Jenkins	Michael	Pacificorp	56	1271-1297
Johnson	Van	Individual	46	646-648
Kelly	Brian	U.S. Fish and Wildlife Service	35	396-407
Larson	Carl	Larson Livestock, Inc.	51	977-981
Mahr	Aaron	National Park Service	45	638-645
Moseley	Claire	Public Lands Advocacy	54	1067-1137
Nordstrom	Jenifer	Western Watersheds Project	60	1305-1507
Anonymous	NA	Individual	58	1303
Anonymous	NA	Individual	59	1304
Pendery	Bruce	Wyoming Outdoor Council	55	1138-1270
Powers	Mick	Uinta County Commissioners	27	322
Putnam	Lynn	Individual	37	564-567
Redden	Jud	Western Wyoming Range Limited Partnership	25	316-320
Robinson	Peter	Individual	11	28-32
Robinson	Gail & Bill	Individual	53	1063-1066
Schaefer	James	EOG Resources, Inc.	36	408-563
Sgamma	Kathleen	Independent Petroleum Association of Mountain States	21	248-269
Sims	Shaun	Uinta County Conservation District	39	569
Sobie	Scott	Fortuna (US) L.P.	15	107-169
Stoddard	Robert	Uinta County Commissioners	28	323
Svoboda	Larry	U.S. Environmental Protection Agency	61	1508-1522
Tanner	Russ	Individual	16	170-177
Tanner	Russ	Individual	33	382

Table A-1. Public Response Index (Continued)

Respondent Last Name	Respondent First Name	Respondent Affiliation	Response Document Number	Comment Number(s)
Teichert	Tim	Individual	5	8
Timbel	Margot	Anschutz Exploration Corporation	47	649-721
Turley	Paul	Individual	38	568
Vanderhoef	Tyler	Yates Petroleum Corporation	49	723-753
Welch	David	Oregon-California Trails Association	29	324-334
Welling	Craig	Uinta County Commissioners	26	321
Williams	Kent	Uinta County Planning Commision	9	24-26
Wischmann	Lesley	Alliance for Historic Wyoming	20	223-247
Zimmerman Winland	Kathleen Mark	National Wildlife Federation & Wyoming Wildlife Federation	44	605-637

Table A-2. Summary Comment and Response Index by Individual Comment

Comment Number	Summary Comment Number	Comment Number	Summary Comment Number	Comment Number	Summary Comment Number	Comment Number	Summary Comment Number
1	00011	51	00006	101	00012	151	00003
2	00011	52	00006	102	00012	152	00004
3	00008	53	00012	103	00012	153	00003
4	00011	54	00015	104	00012	154	00015
5	00011	55	00011	105	00012	155	00012
6	00011	56	00016	106	00014	156	00012
7	00011	57	00013	107	00011	157	00011
8	00011	58	00004	108	00011	158	00003
9	00008	59	00011	109	00003	159	00023
10	00011	60	00011	110	00007	160	00011
11	00011	61	00011	111	00007	161	00011
12	00011	62	00011	112	00022	162	00003
13	00011	63	00011	113	00006	163	00011
14	00011	64	00011	114	00016	164	00011
15	00011	65	00011	115	00015	165	00003
16	00011	66	00014	116	00014	166	00013
17	00011	67	00011	117	00007	167	00013
18	00011	68	00011	118	00013	168	00011
19	00011	69	00011	119	00016	169	00003
20	00006	70	00011	120	00011	170	00011
21	00011	71	00013	121	00007	171	00011
22	00011	72	00011	122	00003	172	00011
23	00011	73	00011	123	00007	173	00011
24	00012	74	00011	124	00013	174	00011
25	00012	75	00011	125	00007	175	00011
26	00011	76	00011	126	00011	176	00011
27	00011	77	00011	127	00011	177	00011
28	00011	78	00011	128	00011	178	00015
29	00012	79	00011	129	00022	179	00011
30	00011	80	00012	130	00007	180	00011
31	00011	81	00016	131	00011	181	00011
32	00011	82	00011	132	00011	182	00011
33	00011	83	00015	133	00016	183	00011
34	00018	84	00012	134	00007	184	00013
35	00018	85	00011	135	00013	185	00013
36	00012	86	00012	136	00007	186	00015
37	00012	87	00010	137	00011	187	00015
38	00012	88	00010	138	00011	188	00015
39	00012	89	00010	139	00007	189	00015
40	00008	90	00011	140	00011	190	00011
41	00011	91	00012	141	00014	191	00015
42	00011	92	00012	142	00003	192	00015
43	00015	93	00011	143	00013	193	00011
44	00007	94	00011	144	00015	194	00011
45	00012	95	00013	145	00015	195	00015
46	00012	96	00003	146	00004	196	00011
47	00006	97	00011	147	00015	197	00015
48	00011	98	00014	148	00014	198	00011
49	00015	99	00011	149	00003	199	00015

Table A-2. Summary Comment and Response Index by Individual Comment

Comment Number	Summary Comment Number
50	00006
201	00011
202	00011
203	00018
204	00015
205	00015
206	00015
207	00011
208	00011
209	00003
210	00003
211	00011
212	00019
213	00011
214	00013
215	00015
216	00005
217	00004
218	00011
219	00004
220	00010
221	00011
222	00011
223	00011
224	00011
225	00011
226	00011
227	00011
228	00011
229	00011
230	00012
231	00012
232	00012
233	00021
234	00011
235	00021
236	00021
237	00011
238	00011
239	00011
240	00011
241	00011
242	00011
243	00011
244	00011
245	00011
246	00011
247	00011
248	00003
100	00012
251	00012
252	00003
253	00023
254	00023
255	00011
256	00011
257	00003
258	00007
259	00011
260	00011
261	00007
262	00011
263	00003
264	00012
265	00015
266	00003
267	00004
268	00013
269	00011
270	00011
271	00006
272	00004
273	00004
274	00006
275	00012
276	00012
277	00013
278	00011
279	00011
280	00011
281	00010
282	00011
283	00004
284	00010
285	00011
286	00011
287	00022
288	00011
289	00011
290	00011
291	00011
292	00003
293	00003
294	00011
295	00011
296	00011
297	00011
298	00011
150	00003
301	00011
302	00011
303	00011
304	00012
305	00011
306	00018
307	00012
308	00011
309	00011
310	00011
311	00011
312	00022
313	00013
314	00011
315	00011
316	00018
317	00018
318	00010
319	00018
320	00011
321	00012
322	00012
323	00012
324	00011
325	00011
326	00011
327	00021
328	00021
329	00012
330	00012
331	00021
332	00011
333	00011
334	00011
335	00011
336	00014
337	00011
338	00012
339	00012
340	00012
341	00012
342	00010
343	00010
344	00012
345	00011
346	00012
347	00011
348	00011
200	00011
351	00012
352	00012
353	00003
354	00013
355	00013
356	00011
357	00003
358	00014
359	00011
360	00011
361	00002
362	00011
363	00011
364	00016
365	00011
366	00004
367	00016
368	00003
369	00014
370	00012
371	00011
372	00006
373	00011
374	00011
375	00011
376	00021
377	00021
378	00021
379	00021
380	00003
381	00003
382	00021
383	00001
384	00011
385	00013
386	00012
387	00013
388	00013
389	00002
390	00013
391	00002
392	00013
393	00002
394	00002
395	00002
396	00011
397	00006
398	00012

Table A-2. Summary Comment and Response Index by Individual Comment

Comment Number	Summary Comment Number	Comment Number	Summary Comment Number	Comment Number	Summary Comment Number	Comment Number	Summary Comment Number
249	00003	299	00011	349	00012	399	00006
250	00012	300	00012	350	00012	400	00011
401	00006	451	00014	501	00012	551	00003
402	00006	452	00003	502	00011	552	00016
403	00006	453	00004	503	00011	553	00012
404	00006	454	00012	504	00011	554	00016
405	00012	455	00014	505	00011	555	00014
406	00011	456	00012	506	00011	556	00021
407	00011	457	00011	507	00014	557	00021
408	00011	458	00014	508	00011	558	00021
409	00011	459	00019	509	00007	559	00014
410	00003	460	00004	510	00011	560	00014
411	00003	461	00011	511	00011	561	00003
412	00013	462	00011	512	00011	562	00003
413	00011	463	00012	513	00011	563	00013
414	00011	464	00011	514	00011	564	00011
415	00013	465	00006	515	00003	565	00011
416	00013	466	00006	516	00011	566	00011
417	00003	467	00011	517	00001	567	00011
418	00011	468	00006	518	00003	568	00011
419	00003	469	00011	519	00003	569	00008
420	00014	470	00006	520	00014	570	00011
421	00003	471	00006	521	00014	571	00011
422	00014	472	00011	522	00011	572	00011
423	00014	473	00011	523	00011	573	00011
424	00014	474	00011	524	00012	574	00013
425	00014	475	00006	525	00001	575	00014
426	00013	476	00011	526	00011	576	00014
427	00013	477	00011	527	00001	577	00011
428	00003	478	00014	528	00012	578	00011
429	00011	479	00011	529	00011	579	00011
430	00011	480	00006	530	00011	580	00007
431	00001	481	00011	531	00002	581	00011
432	00001	482	00006	532	00002	582	00011
433	00001	483	00011	533	00002	583	00011
434	00014	484	00011	534	00011	584	00017
435	00016	485	00006	535	00011	585	00011
436	00012	486	00006	536	00002	586	00011
437	00014	487	00006	537	00012	587	00011
438	00015	488	00011	538	00015	588	00015
439	00015	489	00011	539	00003	589	00011
440	00015	490	00011	540	00014	590	00011
441	00014	491	00014	541	00003	591	00011
442	00002	492	00006	542	00003	592	00021
443	00012	493	00006	543	00011	593	00012
444	00011	494	00006	544	00011	594	00011
445	00011	495	00021	545	00013	595	00011
446	00011	496	00011	546	00003	596	00022
447	00003	497	00012	547	00011	597	00011

Table A-2. Summary Comment and Response Index by Individual Comment

Comment Number	Summary Comment Number	Comment Number	Summary Comment Number	Comment Number	Summary Comment Number	Comment Number	Summary Comment Number
448	00013	498	00012	548	00003	598	00024
449	00011	499	00014	549	00011	599	00011
450	00011	500	00008	550	00012	600	00011
601	00011	651	00014	701	00012	751	00006
602	00011	652	00011	702	00021	752	00006
603	00011	653	00013	703	00011	753	00006
604	00011	654	00011	704	00011	754	00013
605	00011	655	00003	705	00011	755	00011
606	00011	656	00003	706	00021	756	00012
607	00011	657	00003	707	00011	757	00013
608	00011	658	00003	708	00011	758	00013
609	00014	659	00011	709	00003	759	00014
610	00011	660	00004	710	00011	760	00013
611	00011	661	00014	711	00022	761	00013
612	00015	662	00014	712	00011	762	00006
613	00014	663	00011	713	00011	763	00013
614	00011	664	00012	714	00011	764	00022
615	00011	665	00003	715	00011	765	00012
616	00011	666	00003	716	00011	766	00012
617	00011	667	00012	717	00001	767	00015
618	00011	668	00003	718	00001	768	00012
619	00014	669	00014	719	00001	769	00014
620	00012	670	00014	720	00001	770	00007
621	00005	671	00006	721	00001	771	00003
622	00006	672	00006	722	00011	772	00003
623	00006	673	00011	723	00011	773	00011
624	00006	674	00006	724	00003	774	00013
625	00006	675	00011	725	00003	775	00013
626	00006	676	00003	726	00003	776	00013
627	00006	677	00011	727	00003	777	00007
628	00006	678	00014	728	00012	778	00012
629	00006	679	00011	729	00013	779	00012
630	00011	680	00011	730	00011	780	00020
631	00003	681	00006	731	00011	781	00020
632	00016	682	00011	732	00001	782	00020
633	00014	683	00011	733	00011	783	00018
634	00014	684	00006	734	00013	784	00011
635	00011	685	00011	735	00012	785	00012
636	00011	686	00011	736	00012	786	00012
637	00011	687	00015	737	00006	787	00011
638	00011	688	00004	738	00006	788	00012
639	00011	689	00006	739	00003	789	00011
640	00011	690	00011	740	00011	790	00022
641	00011	691	00007	741	00006	791	00007
642	00011	692	00016	742	00011	792	00008
643	00012	693	00011	743	00011	793	00015
644	00012	694	00007	744	00014	794	00011
645	00011	695	00011	745	00003	795	00006
646	00011	696	00011	746	00014	796	00013

Table A-2. Summary Comment and Response Index by Individual Comment

Comment Number	Summary Comment Number	Comment Number	Summary Comment Number	Comment Number	Summary Comment Number	Comment Number	Summary Comment Number
647	00011	697	00003	747	00004	797	00006
648	00011	698	00011	748	00003	798	00011
649	00003	699	00007	749	00014	799	00012
650	00003	700	00007	750	00003	800	00012
801	00014	851	00010	901	00010	951	00012
802	00008	852	00012	902	00011	952	00011
803	00012	853	00014	903	00011	953	00012
804	00012	854	00015	904	00013	954	00012
805	00008	855	00004	905	00014	955	00012
806	00008	856	00012	906	00013	956	00012
807	00008	857	00011	907	00012	957	00012
808	00011	858	00012	908	00011	958	00012
809	00011	859	00012	909	00011	959	00012
810	00011	860	00015	910	00012	960	00012
811	00011	861	00011	911	00011	961	00012
812	00022	862	00022	912	00010	962	00012
813	00008	863	00007	913	00010	963	00012
814	00022	864	00021	914	00010	964	00012
815	00022	865	00021	915	00011	965	00012
816	00012	866	00022	916	00010	966	00012
817	00008	867	00012	917	00010	967	00012
818	00008	868	00022	918	00011	968	00012
819	00007	869	00011	919	00012	969	00012
820	00013	870	00022	920	00012	970	00012
821	00013	871	00011	921	00011	971	00012
822	00007	872	00011	922	00004	972	00012
823	00007	873	00022	923	00004	973	00012
824	00007	874	00022	924	00004	974	00013
825	00007	875	00022	925	00004	975	00003
826	00007	876	00022	926	00007	976	00013
827	00012	877	00022	927	00011	977	00011
828	00007	878	00022	928	00004	978	00011
829	00007	879	00022	929	00011	979	00006
830	00007	880	00022	930	00011	980	00006
831	00021	881	00022	931	00011	981	00011
832	00013	882	00022	932	00011	982	00011
833	00013	883	00022	933	00011	983	00001
834	00010	884	00022	934	00013	984	00011
835	00010	885	00022	935	00013	985	00013
836	00010	886	00022	936	00022	986	00011
837	00004	887	00022	937	00011	987	00011
838	00012	888	00022	938	00013	988	00003
839	00013	889	00022	939	00013	989	00003
840	00013	890	00004	940	00003	990	00015
841	00013	891	00013	941	00003	991	00011
842	00012	892	00021	942	00003	992	00011
843	00010	893	00012	943	00015	993	00012
844	00012	894	00012	944	00003	994	00012
845	00012	895	00015	945	00023	995	00006

Table A-2. Summary Comment and Response Index by Individual Comment

Comment Number	Summary Comment Number	Comment Number	Summary Comment Number	Comment Number	Summary Comment Number	Comment Number	Summary Comment Number
846	00012	896	00011	946	00023	996	00006
847	00004	897	00010	947	00013	997	00011
848	00012	898	00015	948	00023	998	00006
849	00012	899	00001	949	00023	999	00011
850	00012	900	00010	950	00012	1000	00011
1001	00011	1051	00001	1101	00012	1151	00015
1002	00006	1052	00001	1102	00011	1152	00015
1003	00011	1053	00001	1103	00011	1153	00011
1004	00014	1054	00001	1104	00013	1154	00001
1005	00014	1055	00011	1105	00022	1155	00014
1006	00006	1056	00011	1106	00021	1156	00011
1007	00015	1057	00014	1107	00011	1157	00011
1008	00011	1058	00001	1108	00021	1158	00011
1009	00011	1059	00001	1109	00011	1159	00011
1010	00011	1060	00011	1110	00011	1160	00011
1011	00011	1061	00011	1111	00011	1161	00011
1012	00011	1062	00011	1112	00011	1162	00011
1013	00011	1063	00011	1113	00004	1163	00011
1014	00008	1064	00011	1114	00011	1164	00011
1015	00001	1065	00011	1115	00011	1165	00011
1016	00001	1066	00011	1116	00014	1166	00004
1017	00001	1067	00003	1117	00006	1167	00011
1018	00001	1068	00003	1118	00006	1168	00022
1019	00001	1069	00013	1119	00011	1169	00004
1020	00001	1070	00013	1120	00006	1170	00012
1021	00014	1071	00003	1121	00006	1171	00014
1022	00012	1072	00014	1122	00006	1172	00011
1023	00001	1073	00003	1123	00011	1173	00011
1024	00001	1074	00014	1124	00012	1174	00011
1025	00001	1075	00013	1125	00011	1175	00006
1026	00001	1076	00015	1126	00014	1176	00011
1027	00001	1077	00011	1127	00012	1177	00006
1028	00011	1078	00011	1128	00004	1178	00011
1029	00001	1079	00013	1129	00003	1179	00011
1030	00001	1080	00011	1130	00003	1180	00006
1031	00001	1081	00013	1131	00008	1181	00012
1032	00001	1082	00001	1132	00003	1182	00011
1033	00001	1082	00011	1133	00006	1183	00011
1034	00001	1083	00001	1134	00011	1184	00006
1035	00001	1084	00001	1135	00003	1185	00011
1036	00014	1086	00001	1136	00011	1186	00002
1037	00001	1087	00001	1137	00007	1187	00013
1038	00001	1088	00001	1138	00011	1188	00021
1039	00001	1089	00011	1139	00011	1189	00011
1040	00001	1090	00012	1140	00011	1190	00011
1041	00001	1091	00012	1141	00011	1191	00020
1042	00001	1092	00011	1142	00011	1192	00011
1043	00001	1093	00011	1143	00011	1193	00011
1044	00001	1094	00014	1144	00011	1194	00011

Table A-2. Summary Comment and Response Index by Individual Comment

Comment Number	Summary Comment Number	Comment Number	Summary Comment Number	Comment Number	Summary Comment Number	Comment Number	Summary Comment Number
1045	00001	1095	00002	1145	00003	1195	00011
1046	00011	1096	00014	1146	00011	1196	00011
1047	00001	1097	00011	1147	00011	1197	00011
1048	00001	1098	00011	1148	00011	1198	00013
1049	00011	1099	00014	1149	00011	1199	00013
1050	00014	1100	00002	1150	00015	1200	00022
1201	00011	1251	00014	1301	00013	1351	00002
1202	00011	1252	00014	1302	00011	1352	00002
1203	00011	1253	00014	1303	00011	1353	00011
1204	00011	1254	00011	1304	00011	1354	00014
1205	00014	1255	00011	1305	00011	1355	00013
1206	00011	1256	00008	1306	00011	1356	00016
1207	00008	1257	00011	1307	00013	1357	00002
1208	00012	1258	00014	1308	00011	1358	00004
1209	00011	1259	00014	1309	00010	1359	00016
1210	00011	1260	00013	1310	00011	1360	00010
1211	00011	1261	00022	1311	00010	1361	00002
1212	00011	1262	00013	1312	00010	1362	00010
1213	00011	1263	00011	1313	00010	1363	00002
1214	00011	1264	00014	1314	00010	1364	00002
1215	00011	1265	00011	1315	00010	1365	00013
1216	00011	1266	00011	1316	00010	1366	00002
1217	00011	1267	00011	1317	00010	1367	00002
1218	00011	1268	00006	1318	00010	1368	00011
1219	00011	1269	00006	1319	00010	1369	00002
1220	00011	1270	00014	1320	00010	1370	00002
1221	00003	1271	00011	1321	00010	1371	00002
1222	00013	1272	00011	1322	00010	1372	00013
1223	00001	1273	00011	1323	00010	1373	00013
1224	00011	1274	00011	1324	00011	1374	00011
1225	00022	1275	00015	1325	00011	1375	00004
1226	00007	1276	00011	1326	00011	1376	00004
1227	00011	1277	00011	1327	00010	1377	00004
1228	00024	1278	00011	1328	00011	1378	00012
1229	00011	1279	00011	1329	00010	1379	00004
1230	00011	1280	00014	1330	00010	1380	00004
1231	00015	1281	00011	1331	00010	1381	00006
1232	00014	1282	00011	1332	00010	1382	00011
1233	00003	1283	00011	1333	00010	1383	00012
1234	00011	1284	00011	1334	00010	1384	00004
1235	00011	1285	00015	1335	00011	1385	00011
1236	00013	1286	00012	1336	00019	1386	00004
1237	00015	1287	00013	1337	00019	1387	00004
1238	00003	1288	00011	1338	00019	1388	00004
1239	00014	1289	00012	1339	00012	1389	00004
1240	00011	1290	00011	1340	00019	1390	00011
1241	00011	1291	00011	1341	00014	1391	00014
1242	00011	1292	00015	1342	00011	1392	00004
1243	00013	1293	00006	1343	00019	1393	00011

Table A-2. Summary Comment and Response Index by Individual Comment

Comment Number	Summary Comment Number	Comment Number	Summary Comment Number	Comment Number	Summary Comment Number	Comment Number	Summary Comment Number
1244	00015	1294	00011	1344	00019	1394	00006
1245	00011	1295	00006	1345	00019	1395	00004
1246	00015	1296	00021	1346	00014	1396	00011
1247	00011	1297	00011	1347	00004	1397	00004
1248	00011	1298	00011	1348	00019	1398	00011
1249	00011	1299	00011	1349	00014	1399	00011
1250	00004	1300	00013	1350	00002	1400	00011
1401	00010	1432	00006	1463	00003	1494	00011
1402	00004	1433	00006	1464	00003	1495	00011
1403	00010	1434	00014	1465	00011	1496	00011
1404	00010	1435	00006	1466	00011	1497	00011
1405	00004	1436	00006	1467	00011	1498	00011
1406	00011	1437	00011	1468	00011	1499	00011
1407	00011	1438	00011	1469	00013	1500	00011
1408	00006	1439	00006	1470	00003	1501	00011
1409	00006	1440	00011	1471	00003	1502	00011
1410	00006	1441	00006	1472	00003	1503	00018
1411	00006	1442	00006	1473	00003	1504	00014
1412	00011	1443	00006	1474	00003	1505	00008
1413	00006	1444	00011	1475	00003	1506	00011
1414	00011	1445	00015	1476	00011	1507	00011
1415	00004	1446	00015	1477	00011	1508	00011
1416	00011	1447	00014	1478	00011	1509	00011
1417	00012	1448	00011	1479	00013	1510	00011
1418	00006	1449	00003	1480	00011	1511	00011
1419	00011	1450	00011	1481	00011	1512	00001
1420	00002	1451	00011	1482	00015	1513	00001
1421	00010	1452	00015	1483	00011	1514	00001
1422	00002	1453	00015	1484	00011	1515	00001
1423	00014	1454	00011	1485	00024	1516	00001
1424	00004	1455	00003	1486	00010	1517	00001
1425	00006	1456	00015	1487	00010	1518	00001
1426	00012	1457	00015	1488	00010	1519	00011
1427	00011	1458	00015	1489	00010	1520	00011
1428	00011	1459	00014	1490	00010	1521	00011
1429	00006	1460	00011	1491	00011	1522	00011
1430	00006	1461	00015	1492	00011		
1431	00006	1462	00011	1493	00011		

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KEMMERER
PROPOSED RESOURCE MANAGEMENT PLAN AND
FINAL ENVIRONMENTAL IMPACT STATEMENT

Appendix S

Addendum to the Reasonable Foreseeable Development Scenario for Oil and Gas

Introduction

The following report was prepared by the BLM Wyoming State Office Reservoir Management Group at the request of the Kemmerer Field Office as the basis for considering changes to Alternative B in response to public comments on the Draft RMP and EIS. At least twelve individuals and organizations requested in their comments letters that BLM consider limiting leasing and development to protect wildlife habitat in the areas containing large contiguous blocks of sagebrush, mountain shrub, and aspen habitat on BLM-administered surface. The expansion of constraints was requested to reduce the potential effects of habitat fragmentation on sage-dependent species, such as pygmy rabbit, sagebrush obligate migratory birds, and sage-grouse.

Other public comments requested that BLM consider protecting the sagebrush, mountain shrub, and aspen habitat within the contiguous blocks of BLM-administered surface by allowing lease sales with no surface occupancy (NSO) stipulations, which would limit surface disturbance while allowing development and extraction of fluid minerals.

To adequately address the public comments and requests for additional analyses in the Proposed RMP and Final EIS, the BLM Reservoir Management Group was asked to project the reductions in potential well numbers that would result from the designating the contiguous BLM-administered contiguous habitat either unavailable for leasing or available for leasing with an NSO stipulation. The following addendum to the 2006 Reasonable Foreseeable Development Scenario (BLM 2006) was developed to use as a basis for analysis of the additional constraints under Alternative B and a new proposed NSO alternative, called Alternative B1 that is evaluated further in Appendix Q.

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KEMMERER UNLEASED FEDERAL LANDS GEOLOGIC OIL AND GAS ANALYSIS KEMMERER FIELD OFFICE, WYOMING

DEAN P. STILWELL
AND
J. DAVID CHASE

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
WYOMING STATE OFFICE
RESERVOIR MANAGEMENT GROUP

FINAL REPORT

February 14, 2008

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Summary

A brief geological analysis of the potential for future activity in three blocks of Bureau managed lands was prepared. The potential technical and economic feasibility of directionally and horizontally drilling potential was discussed in a qualitative manner for each block. The projections of the Final Reasonable Foreseeable Development Scenario for Oil and Gas were reviewed. We analyzed their projections for this region and determined that up to 105 wells may not be drilled in the three blocks if presently leased lands remain unleased for the planning period. If these lands are allowed to be leased with a no surface occupancy stipulation, then up to 65 wells may not be drilled. Our projections of potential future undrilled wells for no leasing and no surface occupancy scenarios for each individual block are shown in the attached table and described below.

Introduction

A map was prepared to go with this analysis. It shows all active and abandoned wells, oil and gas fields, Raymond Mountain WSA, selected USGS potential oil and gas targets, selected blocks of land analyzed for this report, the Fortuna U.S. LP Bear Canyon project, Federal oil and gas mineral lands, Federal oil and gas leases within selected blocks of land, and the Bridger – Teton Forest boundary. Areas with significant amounts of presently unleased potential oil and gas lands were divided into three blocks for analysis purposes. For each block we prepared a brief geologic analysis that discusses past drilling activity, potential plays, projections of play potential (further exploration and development activities that could occur), and technical opportunities for directional drilling.

Blocks A and B

The USGS (2004 and 2006b) recently assessed the undiscovered resource of the Wyoming Thrust Belt Province. They predicted that part of the undiscovered resource covering areas that include Blocks A and B could amount to about 39 million barrels of oil, 57 million barrels of natural gas liquids, and 557 billion cubic feet of gas. The USGS found that 20 oil and gas accumulations had been discovered to date and projected that up to 16 additional oil accumulations with more than 0.5 million barrels of oil and up to 28 gas accumulations with more than 3 billion cubic feet of gas could be discovered in the future. Most accumulations are expected to be in a depth range of 11,000 to 12,000 feet (USGS, 2004 and 2006b).

Block A – Townships 25-28 North, Ranges 118 and 119 West

Seven drilled and abandoned wells lie in Block A (see map). Six were drilled in the Absaroka Thrust Play identified by the USGS in its 1995 assessment (Beeman et al, 1996), and one well was drilled in the Crawford-Meade Thrusts Play (lands immediately west of the Absaroka Thrust Play). The one well in the Crawford-Meade Thrusts Play drilled to 8,935 feet in 1962 and was abandoned with no hydrocarbon shows.

Of the six wells drilled in the Absaroka Thrust Play, only one well reported hydrocarbon shows. Those shows were in the Triassic Thaynes Formation and Permian Phosphoria Formation. The earliest well spud (1959) drilled to only 1,010 feet. The other wells were spud between 1965 and 1981and tested depths of 6,200 to 18,769 feet. The Federal #1-23 in section 23 of Township 25

North, Range 118 West appears to have drilled through the entire package of Overthrust sediments and encountered the subthrust Cretaceous Bear River Formation at 18,340 feet.

The eastern part of Block A lies within the northernmost part of the Absaroka Thrust Play identified by the USGS in its 1995 assessment (see map). Nearest production lies more than 20 miles south. This portion of the Absaroka Thrust Play in Block B appears to have low potential for the discovery of new economic hydrocarbon reserves.

The western part of Block A (west of the Absaroka Thrust Play) lies within the hypothetical Crawford-Meade Thrusts Play identified by the USGS in its 1995 assessment (see map). The USGS identified the southern part of this play (that area lying in Utah) as having the most potential. The portion of the Crawford-Meade Thrusts Play lying within Block A has very little potential for the discovery of new economic hydrocarbon reserves.

Of the three blocks analyzed, Block A has the lowest potential for the discovery of new hydrocarbon traps, and we would not anticipate interest, other than sporadic exploratory proposals, in this area within the planning period. The projections of the Final Reasonable Foreseeable Development Scenario for Oil and Gas were reviewed. We analyzed their projections for this region and determined that up to 10 wells may not be drilled in Block A if presently leased lands remain unleased for the planning period. If these lands are allowed to be leased with a no surface occupancy stipulation, then up to five wells may not be drilled in Block A.

Since most reservoirs in this area are expected to be greater than 11,000 feet in depth, directional drilling is technically feasible at ¾ to one mile from the surface location. We expect that a directional well (most likely s-shaped) could be economic with up to a ¾ mile deviation. More information than is available would be needed to determine potential economics for any deviated wellbore extending more than ¾ of a mile from the surface location.

We expect that a horizontal wellbore would be technically and economically feasible up to one mile from the surface location. More information than is available would be needed to determine potential economics for any horizontal wellbore extending more than one mile from the surface location.

Block B – Townships 21-24 North, Ranges 118 and 119 West

Industry has drilled and abandoned 17 wells in Block B (see map). Sixteen were drilled in the Absaroka Thrust Play identified by the USGS in its 1995 assessment (Beeman et al, 1996), and one well was drilled in the Crawford-Meade Thrusts Play. In addition, three wells have been productive of oil and gas, and Fortuna US LP is currently drilling a well in their Bear Canyon Project area. The Ordovician Bighorn Dolomite has produced oil and gas from the productive wells at depths between 13,000 and 14,000 feet.

The earliest well spud was a 1928 well drilled to 1,525 feet. All other wells were spud between 1976 and 1991. These wells were drilled to depths ranging from 8,730 to 17,316 feet. Almost 90 percent of these wells drilled deeper than 12,300 feet. Eight wells appear to have drilled through the entire package of Overthrust sediments and encountered subthrust Cretaceous sediments. Depths to the subthrust ranged from 12,805 to 15,890 feet.

In addition to the three productive wells, shows of hydrocarbons occurred in;

- the Bear Canyon #1-24 in section 24 of Township 23 North, R. 118 West – gas in the Devonian Darby Formation and oil in the Ordovician Bighorn Dolomite,
- the Dempsey Ridge #20-11 in section 20 of Township 22 North, 118 West - H2S gas-cut water in the Ordovician Bighorn Dolomite,
- the Federal Beckwith #26-1 in section 26 of Township 23 North, 119 West - gas cut water Triassic Thaynes Formation, and
- the Road Hollow #2 in section 29 of Township 21 North, 118 West - oil and gas in the Ordovician Bighorn Dolomite.

Most of Block B lies within the Absaroka Thrust Play (see map). Production from this play occurs in the three wells, in the Collett Creek Field area on the south end of Block B. In addition, the four wells described above tested shows of hydrocarbons. This portion of the Absaroka Thrust Play has a higher potential for the discovery of new economic hydrocarbon reserves than Block A, and some of the undiscovered accumulations projected by the USGS (2004 and 2006b) are likely to occur in this block. Any reservoirs discovered in this part of Block B may be most economic if drilled with horizontal legs. In addition, significantly fewer wellbores would be needed to fully develop reservoirs if horizontal legs are economic to drill and produce. Fortuna U.S. LP is presently attempting to test this idea at their Bear Canyon Project in Block B (see map).

The westernmost part of Block B (west of the Absaroka Thrust Play) lies within the hypothetical Crawford-Meade Thrusts Play identified by the USGS in its 1995 assessment (see map). The one well testing this play in Block B had no hydrocarbon shows. This portion of Block B has little potential, as described for Block A.

The projections of the Final Reasonable Foreseeable Development Scenario for Oil and Gas were reviewed. We analyzed their projections for this region and determined that up to 45 wells may not be drilled in Block B if presently leased lands remain unleased for the planning period. If these lands are allowed to be leased with a no surface occupancy stipulation, then up to 25 wells may not be drilled in Block B.

Since most reservoirs in block B are expected to be greater than 11,000 feet in depth, directional drilling is technically feasible at ¾ to one mile from the surface location. We expect that a directional well (most likely s-shaped) could be economic with up to a ¾ mile deviation. More information than is available would be needed to determine potential economics for any deviated wellbore extending more than ¾ of a mile from the surface location.

We expect that a horizontal wellbore would be technically and economically feasible up to one mile from the surface location. More information than is available would be needed to determine potential economics for any horizontal wellbore extending more than one mile from the surface location.

Block C - Townships 22-24 North, Ranges 113 and 114 West

Block C lies within the Southwestern Wyoming Province on the western edge of the Greater Green River Basin (see map). The westernmost edge of Block C lies in the Wyoming Thrust Belt Province. That area was not reviewed further since that part of Block C is not of interest to the Kemmerer Field Office. The USGS (2005 and 2006a) recently assessed the undiscovered resource of the Southwest Wyoming Province. They predicted a large undiscovered resource in the Province. Parts of five assessment units cover at least part of Block C (three conventional types, one with continuous reservoir types, and one coalbed gas type). A number of oil and gas accumulations could occur and be economically productive within this part of Block C. Most accumulations are expected to be in at depths greater than 11,000 (USGS, 2005 and 2006a). Any potential coalbed gas accumulations in the Fort Union Coalbed Gas Assessment Unit (see map) would be at shallower depths (3,500 to 6,000 feet).

Fields to the west of Block C would not be analogous to potential reservoirs so are not reviewed. Fields on the east side of Block C produce from the Cretaceous Frontier and Dakota formations on the Moxa Arch, an anticlinal structure. Depositional facies of the Frontier change from those that are productive on the east side of Block C to facies in the rest of Block C that have lower potential for accumulation of good reservoir rocks. The Dakota remains as a high potential reservoir throughout Block C. One or more potential new Dakota reservoirs similar to the new Dakota reservoir at Ballerina Field immediately south of Block C (see map) are good potential targets in Block C. Dakota Formation reservoirs would generally be found at depths greater than 12,000 feet.

Although Block C is off the west flank of the Moxa Arch a number of small local structures are known to be present and additional structures may be located in the future. These structures have the potential to contain additional trapped reservoirs in formations both above and below the Dakota Formation. These types of reservoirs are less likely to be present than Dakota Formation reservoirs. In addition, the USGS (2005 and 2006a) has identified a Fort Union coalbed gas play that covers most of Block C (see map). Any potential coalbed gas reservoir would be in the 3,000 to 6,000 foot range, and well spacing at these depths would be expected to be at 160 acres. Coalbed gas potential has not yet been tested in the area and would not be likely in the short term.

The projections of the Final Reasonable Foreseeable Development Scenario for Oil and Gas were reviewed. We analyzed their projections for this region and determined that up to 50 wells may not be drilled in Block C if presently leased lands remain unleased for the planning period. If these lands are allowed to be leased with a no surface occupancy stipulation, then up to 35 wells may not be drilled in Block C.

Since the most likely reservoir (Dakota Formation) and deeper potential reservoirs in block C are expected to be greater than 12,000 feet in depth, directional drilling is technically feasible at ¾ to one mile from the surface location. We expect that a directional well (most likely s-shaped) could be economic with up to a ¾ mile deviation. More information than is available would be needed to determine potential economics for any deviated wellbore extending more than ¾ of a mile from the surface location.

Other shallower reservoirs (including coalbed gas) would not be as amenable to directional drilling with such large deviations due to economic considerations. These potential reservoirs would be expected to have lower potential reserves than the Dakota Formation and so would be less likely to be able to economically bear the costs of significant deviation.

At present, characteristics of potential reservoirs (especially lack of identified fracture porosity) in Block B do not make them a likely target for horizontal wellbores.

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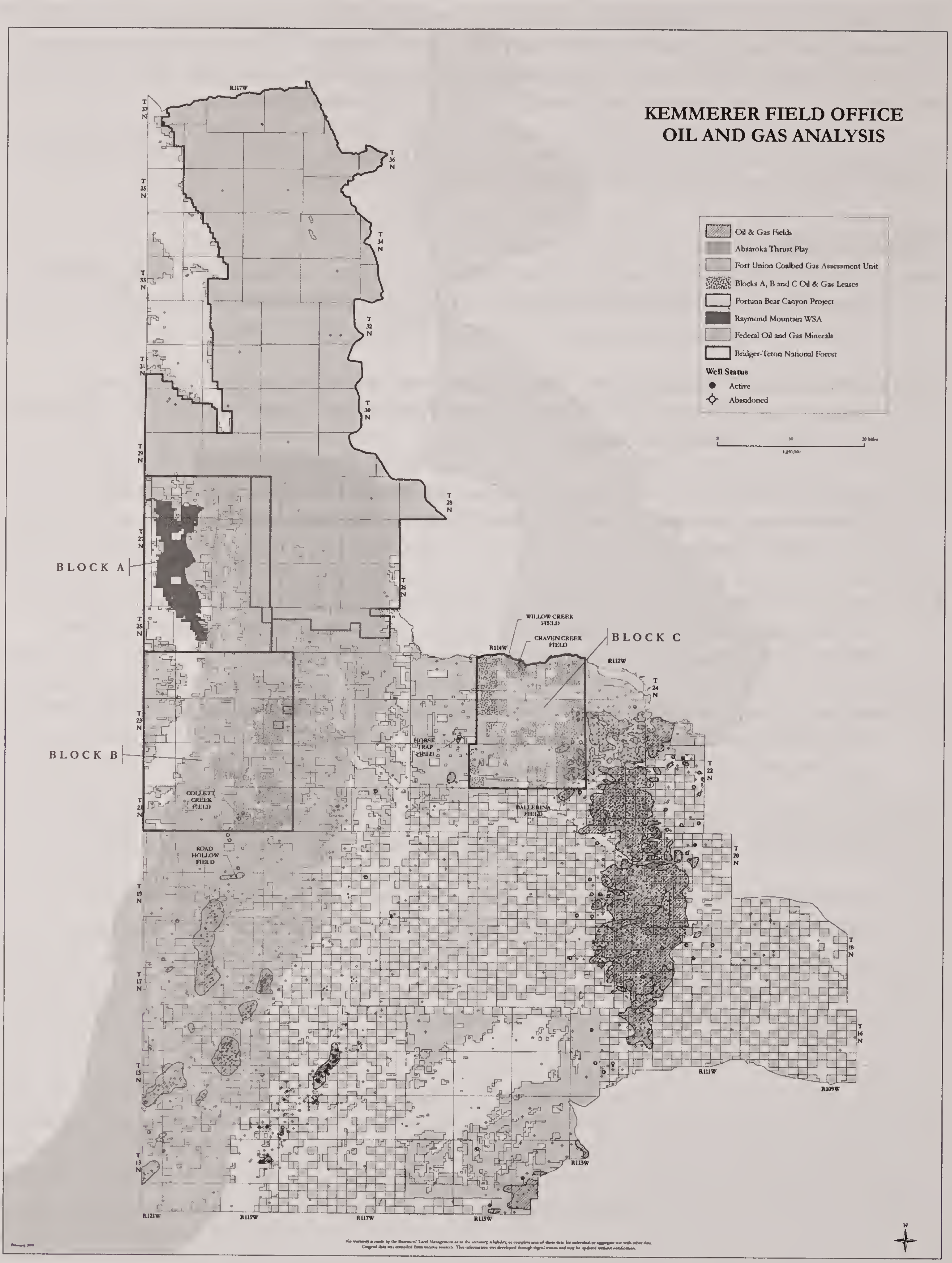

KEMMERER FIELD OFFICE OIL AND GAS ANALYSIS

Oil & Gas Fields
Absaroka Thrust Play
Fort Union Coalbed Gas Assessment Unit
Blocks A, B and C Oil & Gas Leases
Fortuna Bear Canyon Project
Raymond Mountain WSA
Federal Oil and Gas Minerals
Bridger-Teton National Forest
Well Status
● Active
Abandoned
0
10
20 Miles
1:250,000
BLOCK A
BLOCK B
BLOCK C
WILLOW CREEK FIELD
CRAVEN CREEK FIELD
HORSE TRAP FIELD
COLLETT CREEK FIELD
BALLERINA FIELD
ROAD HOLLOW FIELD
R117W
R114W
R112W
R111W
R109W
R113W
R121W
R119W
R115W
T 37 N
T 36 N
T 35 N
T 34 N
T 33 N
T 32 N
T 31 N
T 30 N
T 29 N
T 28 N
T 27 N
T 26 N
T 25 N
T 24 N
T 23 N
T 22 N
T 21 N
T 20 N
T 19 N
T 18 N
T 17 N
T 16 N
T 15 N
T 13 N
N

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data was compiled from various sources. This information was developed through digital means and may be updated without notification.

RFD Well Estimate by Geologic Play (Number of Projected Wells)	**Block A**		**Block B**		**Block C**	
	No Leasing	No Surface Occupancy	No Leasing	No Surface Occupancy	No Leasing	No Surface Occupancy
Crawford-Meade Thrust (20)	3	1	8	6		
Absaroka Thrust (160)	7	4	37	19		
Fort Union Coalbed Gas (40)					20	20
Green River Basin (1,740)					30	15
Total Well Reduction	**10**	**5**	**45**	**25**	**50**	**35**

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KEMMERER
PROPOSED RESOURCE MANAGEMENT PLAN AND
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GLOSSARY

Glossary

Action Avoidance: Utilizing guidance to allow an action only if all other options have been examined and it remains the only practicable solution.

Administratively Unavailable for Oil and Gas Leasing: An administrative decision to indefinitely postpone offering lands for lease subject to further National Environmental Policy Act analysis that demonstrates that the objectives for initially holding lands from lease offering can be alternatively met or no longer apply.

Allotment: An area of land designated and managed for grazing of livestock. Allotments are Bureau of Land Management (BLM) lands, but may also include other federally managed, state-owned, and private lands. An allotment may include one or more separate pastures. Livestock numbers and periods of use are specified for each allotment. Allotments are classified by the following:

Category I – Improve Existing Resource Conditions
Category M – Maintain Existing Resource Conditions
Category C – Custodial Management.

Analysis Area: Any lands, regardless of jurisdiction, for which the BLM synthesizes, analyzes, and interprets data for information that relates to planning for BLM-administered lands.

Animal Unit Month (AUM): A standardized measurement of the amount of forage necessary for the sustenance of one cow unit or its equivalent for 1 month (approximately 800 pounds of forage).

Best Management Practices (BMPs): A suite of techniques that guide, or may be applied to, management actions to aid in achieving desired outcomes. BMPs often are developed in conjunction with land use plans, but they are not considered a land use plan decision unless the land use plan specifies that they are mandatory. They may be updated or modified without a plan amendment if they are not mandatory (BLM Manual Handbook H-1601-1).

Big Game Crucial Winter Range: Winter habitats on which wildlife species depend for survival. Because of severe weather conditions or other limiting factors, no alternative habitats would be available.

Borrow Material: A construction-related term that refers to unprocessed material excavated from a borrow pit for use as fill at another location.

Checkerboard Land Pattern: Alternating sections of federally owned lands and private or state lands on either side of the Union Pacific Railroad in Southwestern Wyoming. This pattern of land ownership looks like a checkerboard on maps, using different colors to show land status.

Class I Wells: Injection wells that are

(1) Wells used by generators of hazardous waste or owners or operators of hazardous waste management facilities to inject hazardous waste beneath the lowermost formation containing, within ¼ mile of the well bore, an underground source of drinking water.

(2) Other industrial and municipal disposal wells that inject fluid beneath the lowermost formation containing, within ¼ mile of the well bore, an underground source of drinking water.
(3) Radioactive waste disposal wells that inject fluid below the lowermost formation containing an underground source of drinking water within ¼ mile of the well bore.

Class II Wells: Injection wells

(1) That are brought to the surface in connection with natural gas storage operations, or conventional oil or natural gas production, and may be commingled with wastewaters from gas plants, which are an integral part of production operations, unless those waters are classified as a hazardous waste at the time of injection.

(2) For enhanced recovery of oil or natural gas.

(3) For storage of hydrocarbons that are liquid at standard temperature and pressure.

Closed: Generally denotes that an area is not available for a particular use or uses. Refer to specific definitions found in law, regulations, or policy guidance for application to individual programs.

Commodity: An economic good, such as a product of agriculture or mining.

Comprehensive Weed Management Plan: A plan for controlling invasive plant species that incorporates integrated weed management techniques and accounts for pertinent considerations, such as management actions and allocations affecting weeds.

Constraint: An assumption for analysis based on surface restrictions (alone or in combination) that may negatively influence the manner in which an oil and gas developer may operate on the land.

Controlled Surface Use (CSU): Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts. Identified resource values require special operational constraints that may modify the lease rights. CSU is used for operating guidance, not as a substitute for the no surface occupancy or timing limitation stipulations.

Cultural Resource Inventory Levels: A three-tiered process for discovering, recording, and evaluating cultural resources.

(a) **Class I** - A compilation and analysis of all reasonably available cultural resource information, and a management-focused, interpretive, narrative overview, and synthesis of the data.

(b) **Class II** - A sampling survey usually aimed at developing and testing a predictive model of cultural resource distribution.

(c) **Class III** - An intensive on-the-ground survey to discover, record, and evaluate cultural resources within a specific geographic area.

dB (decibel): A unit of measurement of the loudness or strength of a signal. One decibel is considered the smallest difference in sound level that the human ear can discern. Decibels are a relative measurement derived from two signal levels: a reference input level and an observed output level. A decibel is the logarithm of the ratio of the two levels. One Bel is when the output signal is 10 times that of the input and 1 decibel is $1/10^{th}$ of a Bel.

Designated Roads and Trails: Specific roads and trails on which some type of motorized vehicle use is allowed either seasonally or yearlong.

Desired Future Condition: Landscape conditions and management scenarios that should exist for a specific land area and for a specific resource (e.g., livestock grazing or wildlife) that meet the managing agency's vision statement and objectives for ecological, economic and social considerations.

Dispersed Recreation: Recreational activities are considered "dispersed" when they do not depend on developed facilities, such as campgrounds, playgrounds, or developed park areas. User density is often low relative to developed or intensive recreation. Activities thought of as examples of dispersed recreation include, but are limited to, primitive camping, hunting, hiking, and off-highway driving. Dispersed recreation is usually noncommercial.

Dispersed Uses: Certain activities occurring on BLM-administered lands that do not require specific authorizations and do not necessarily cause any appreciable disturbance or damage to the public lands. Camping, parking, picnicking, and recovering a harvested big game animal are examples of dispersed uses. These are activities that can normally be accomplished within a minimal distance of roads and vehicle trails. The public is allowed to pursue these activities *up to 300 feet away from roads* and trails, as long as such activities do not cause resource damage or create new roads or extend existing roads.

Disruptive Activities: Those authorized public land resource uses/activities that are likely to alter the behavior, displace, or cause excessive stress to existing animal or human populations occurring at a specific location and/or time. This term does not apply to the physical disturbance of the land surface, vegetation, or features.

Ecological Site: Land with a specific potential natural community and specific physical site characteristics, differing from other kinds of land in that the site has the ability to produce distinctive kinds and amounts of vegetation and to respond to management. Ecological sites are defined and described in terms related to soil, species composition, and annual production.

Ephemeral Stream: A stream that flows only in direct response to precipitation and whose channel is at all times above the water table. Confusion over the distinction between intermittent and ephemeral streams may be minimized by applying Meinzer's suggestion that the term "ephemeral" be arbitrarily restricted to streams that do not flow continuously for at least 30 days (Prichard et al. 1998). Ephemeral streams support riparian areas when streamside vegetation reflects the presence of permanent subsurface water.

Exceedance: An event in which measurements of ambient air quality are above the national ambient air quality standard (NAAQS) or Wyoming Department of Environmental Quality (DEQ) standard set for a particular pollutant. For example, an annual average nitrogen dioxide value of 110 micrograms per cubic meter (μg/m$^{3)}$ is an exceedance of both the NAAQS and Wyoming DEQ annual average standard for nitrogen dioxide of 100 μg/m^3.

Exclusion Area: An area on public lands where a certain activity (or activities) is prohibited to ensure protection of other resource values present on the site. The term is frequently used in reference to lands/realty actions and proposals (e.g., rights-of-way, etc.), but is not unique to lands and realty program activities.

Existing Roads and Trails: Routes existing prior to the date the off-highway vehicle designation is announced in the *Federal Register*. These regularly used routes may have been constructed and maintained or may be two-track routes created and maintained by the passage of motor vehicles.

Extensive Recreation Management Areas (ERMAs): A public lands unit identified in land use plans containing all acreage not identified as a SRMA. Recreation management actions within an ERMA are limited to only those of a custodial nature.

Fire Management Plan: A plan that identifies appropriate strategies to achieve resource objectives, as well as identifies fire policy, objectives, and prescribed actions. A Fire Management Plan may include maps, charts, tables, and statistical data.

Fire Regime Condition Class: A classification of the amount of departure from the natural fire regime. The departure results in changes to one or more of the following ecological components: vegetation characteristics (e.g., species composition, structural stages, stand age, canopy closure, and mosaic pattern), fuel composition, fire frequency, severity, and pattern, and other associated disturbance (e.g., insect and disease mortality, grazing, and drought). The three condition classes are listed below.

(a) **Condition Class 1**

- The historic disturbance regime is largely intact and functioning (e.g., has not missed a fire-return interval)
- Potential intensity and severity of fire within historic range
- Effects of disease and insects within historic range
- Hydrologic functions within normal historic range
- Vegetation composition and structure resilient to disturbances
- Nonnative species currently not present or to a limited extent
- Low risk of loss for key ecosystem components

(b) **Condition Class 2**

- Moderate alterations to historic disturbance regime evident (e.g., missed one or more fire-return intervals)
- Effects of disease and insects pose an increased risk of loss of key community components
- Riparian areas and associated hydrologic function show measurable signs of adverse departure from historic conditions
- Vegetation composition and structure shifted toward conditions less resilient to disturbances
- Populations of nonnative species may have increased, increasing the risk of further increases following disturbance

(c) **Condition Class 3**

- Historic disturbance regime significantly altered; historic disturbance processes and impacts may be precluded (e.g., missed several fire-return intervals)
- Effects of disturbance (fire, insects, and disease) may cause significant or complete loss of key community components
- Hydrologic functions may be adversely altered; high potential for increased sedimentation and reduced streamflows
- Invasive nonnative species may be common and, in some cases, the dominant species on the landscape; disturbance will likely increase both the dominance and geographic extent of these invasive species
- Highly altered vegetation composition and structure predisposes community to disturbance events outside the range of historic availability; disturbance may have effects not observed or measured before

Fire-Return Interval: The number of years between two successive fire events at a specific site or area.

Flaring/Venting: The controlled burning (flare) or release (vent) of natural gas that cannot be processed for sale or use because of technical or economic reasons.

Floodplain Connectivity: Maintenance of lateral, longitudinal, and vertical pathways for biological and hydrological processes in the floodplain. Examples of failures to maintain connectivity could include culverts or levees that restrict flow in the floodplain and focus overbank flow into the channel.

Flushing Livestock: The holding of livestock in an invasive, nonnative species (INNS) seed-free area where they are fed an INNS seed-free diet for 72 hours, thus flushing INNS seed from the animals' digestive systems.

Foreground-Middle Ground Zone: An area that can be seen from a travel route for a distance of 3 miles (foreground) to 5 miles (middle ground) where management activities might be viewed. A distance from 5 to 15 miles is called the *Background Zone* and the area beyond 15 miles is called the *Seldom-Seen Zone.*

Geologic Resources: Resources associated with the scientific study of the Earth, including its composition, structure, physical properties, and history. Geologic resources commonly include the study of minerals (**mineralogy**) and rocks (**petrology**); the structure of the Earth (**structural geology**) and volcanic phenomena (**volcanology**); and landforms and the processes that produce them (**geomorphology** and **glaciology**).

Goal: A broad statement of a desired outcome. Goals usually are not quantifiable and may not have established timeframes for achievement.

Guzzler: A water development for wildlife.

HABS/HAER: The Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) is an integral component of the federal government's commitment to historic preservation. The program documents important architectural, engineering, and industrial sites throughout the United States and its territories. A complete set of HABS/HAER documentation, comprising measured drawings, large-format photographs, and written history, plays a key role in accomplishing the mission of creating an archive of American architecture and engineering and in better understanding what historic resources tell us about America's diverse ethnic and cultural heritage. To insure that such evidence is not lost to future generations, the HABS/HAER collections are archived at the Library of Congress, where they are available to the public.

Heavy Equipment Use: This phrase is used in fire management and is relative to limiting fire suppression tactics. In this context it refers to not using dozers, skidders, or graders in areas where important resource values are in need of protection. Fire engines and water tenders used during suppression activities would be allowed.

Held by Production: Leases that become productive and do not terminate until all wells on the lease have ceased production are "held by production."

Historic Property: Any prehistoric or historic district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places.

Impact Analysis for Planning (IMPLAN 2000) Model: IMPLAN is a regional economic model that provides a mathematical accounting of the flow of money, goods, and services through a region's economy. The model provides estimates of how a specific economic activity translates into jobs and income for the region. It includes the "ripple effect" (also called the "multiplier effect") of changes in economic sectors that may not be directly impacted by management actions, but are linked to industries that are directly impacted. In IMPLAN, these ripple effects are termed indirect impacts (for changes in industries that sell inputs to the industries that are directly impacted) and induced impacts (for changes in household spending as household income increases or decreases due to the changes in production).

Integrated Weed Management: The use of all appropriate weed control measures, including fire and mechanical, chemical, biological, and cultural techniques, in an organized and coordinated manner on a site-specific basis.

Intermittent Stream: A stream that flows only at certain times of the year due to receiving water from springs or a surface source, such as melting snow in mountainous areas. Confusion over the distinction between intermittent and ephemeral streams may be minimized by applying Meinzer's suggestion that the term "intermittent" be arbitrarily restricted to streams that flow continuously for periods of at least 30 days (Prichard et al. 1998).

Key Observation Point (KOP): Term used in visual resource management for one or a series of points (displayed as lines) on a travel route or at a use area or potential use area, where the view of a management activity would be most revealing. Those used in the Kemmerer planning area include (refer to Map 66):

Towns: Afton, Alpine, Cokeville, Diamondville, Evanston, Frontier, Granger, Kemmerer, Lyman, Mountain View, and Thayne.

Historic sites: National Historic Trails, Gateway Site, The Pinegrove, Rocky Gap, The Rock Slide, Nancy Hill Grave, Alfred Corum Grave, Emigrant Springs Dempsey, Sublette Historic Mining Town, Johnston Scout Rock, Emigrant Springs Slate Creek, Cumberland Mine and Town, Bridger Antelope Trap, Carter Historic Rail Road Town, Fort Bridger, Lincoln Highway, Piedmont Kilns, Aspen Rail Road Station, Hilliard Kilns and Rail Road Station, The Needles

Roads: Fossil Butte Road, Pine Creek Road, Igo Speedway, Coal Creek Road, Dempsey Ridge Road, Smiths Fork Road

County Roads: 103,151,173,180,204,207,209,221,233,265,271,283,285,306,311,314,316

State Highways: SR 89, SR 150, SR 189, SR 232, SR 233, SR 240, SR 372, SR 410, SR 412, SR 413, SR 414

U.S. Highways: US 30, US 189

Interstate Highway: I-80

Campgrounds: Fontenelle, Weeping Rock, Tailrace, Slate Creek

Other Recreation Areas:

- Fossil Butte National Monument has 5 KOPs, one at each corner and the visitor center.
- Viva Naughton cross-country ski trail.
- Wyoming Range snowmobile trail P and the part of snowmobile trail B that is located on BLM administered land.
- The west shoreline of Fontenelle Reservoir.

Land-Tenure Adjustment: This term refers to a change in land ownership patterns, or legal status, to improve their administrative manageability and/or their usefulness to the public.

Leasable Minerals: Those minerals or materials subject to lease by the federal government under the Mineral Leasing Act of 1920. Leasable minerals include coal, phosphate, asphalt, sulphur, potassium, oil shale, and sodium minerals, including trona. Oil and gas, as well as geothermal resources, also are included.

Lek: A traditional courtship display area attended by male sage-grouse in or adjacent to sagebrush dominated habitat. Designation of the site as a lek requires observation of two or more male sage-grouse engaged in courtship displays. In addition new leks must be confirmed by a survey conducted during the appropriate time of day and during the strutting season. Observation of sign of strutting activity can also be used to confirm a suspected lek.

Lek Complex: A group of leks in close proximity between which male sage-grouse may be expected to interchange from one day to the next. A specific distance criteria does not yet exist.

Lek Count: A census technique that documents the actual number of male sage-grouse observed on a particular lek or complex of leks using the methods described below.

Lek Survey: A monitoring technique designed primarily to determine whether leks are active or inactive and obtaining accurate counts of the numbers of males attending is secondary.

Annual status – Each year a lek will be determined to be in one of the following status categories:

Active: Any lek that has been attended by male sage-grouse during the strutting season. Presence can be documented by observation of birds using the site or by signs of strutting activity.

Inactive: Leks where it is known that there was no strutting activity through the course of a strutting season. A single visit, or even several visits, without strutting sage-grouse being seen is not adequate documentation to designate a lek as inactive. This designation requires either an absence of birds on the lek during multiple ground visits under ideal conditions throughout the strutting season or a ground check of the exact lek site late in the strutting season that fails to find any sign (droppings/feathers) of strutting activity.

Unknown: Leks that have not been documented either active or inactive during the course of a strutting season.

Based on annual status a lek may be put into one of the following categories for management purposes:

Occupied Lek: A lek that has been active during at least one strutting season within the last ten years. Management protection will be afforded to occupied leks.

Undetermined Lek: Any lek that has not been documented as being active in the last ten years but does not have sufficient documentation to be designated unoccupied. Management protection will be afforded to undetermined leks until their status has been documented as unoccupied.

Unoccupied Lek (formerly termed "historical lek"): There are two types of unoccupied leks, "destroyed" or "abandoned." Management protection will not be afforded to unoccupied leks.

Abandoned lek: A lek in otherwise suitable habitat that has not been active during a consecutive ten-year period. Before a lek is designated "abandoned" it must be confirmed as "inactive" (see above criteria) in at least four non-consecutive strutting seasons spanning the ten years. Once designated "abandoned", the site should be surveyed at least once every ten years to determine whether or not the lek has been reoccupied.

Destroyed lek: A formerly active lek site and surrounding sagebrush habitat that has been destroyed and no longer capable of supporting sage-grouse breeding activity. A lek site that has been strip-mined, paved, converted to cropland or undergone other long-term habitat type conversion is considered destroyed. Destroyed leks do not require monitoring unless the site is reclaimed to suitable sage-grouse habitat.

Migratory population: Sage-grouse that move more than 6.2 miles (10 km) between two or three seasonal ranges (Connelly et al. 2003).

Non-migratory population: Sage-grouse that do not move more that 6.2 miles (10 km) between seasonal ranges (Connelly et al. 2003).

Winter Concentration Area: An area where large numbers of sage-grouse have been documented to consistently use specific landscapes for winter habitat. Habitat characteristics include sagebrush that is generally 10-14 inches (25-36 cm) above the snow and sagebrush canopy cover above the snow that ranges from 10 to 30 percent. Topography tends to be on flat to generally southwest facing slopes or on ridges where sagebrush height may be less than 10 inches (25 cm) but the snow is routinely blown clear by wind. Winter concentration areas do not include all winter habitats used by sage-grouse, nor are they limited to more narrow "severe winter relief" habitats (a survival range). Delineation of these concentration areas is based on determination of the presence of winter habitat characteristics confirmed by repeated observations and/or sign of large numbers of sage-grouse. The definition of "large" is dependent on whether the overall population is large or small. In core population areas frequent observations of groups of 50+ sage-grouse meet the definition while in marginal populations group size may be 25+. Consultation and coordination with the WGFD is required when delineating winter concentration areas.

Livestock Conversion: Changing the kind of livestock allowed to graze an allotment, such as from sheep to cattle.

Locatable Minerals: The minerals are subject to exploration, development, and disposal by staking mining claims as authorized by the Mining Law of 1872, as amended. Such minerals include deposits of metallic minerals, such as gold, silver, and other uncommon materials, not subject to lease or sale.

Mechanical Transport: Any nonmotorized vehicle, device, or contrivance for moving people or material over land, water, snow, or air that has moving parts. This includes, but is not limited to, sailboats, sailboards, hang gliders, parachutes, bicycles, game carriers, hand carts, wheel barrows, and wagons. The term does not include wheel chairs, nor does it include horses or other pack stock, skis, snowshoes, nonmotorized river craft, including, but not limited to, drift boats, rafts, and canoes, or sleds, travois, or similar devices without moving parts. The terms "mechanical transport" and "motor vehicle" are not synonymous.

Mechanized Vehicle Use: The use of land by any nonmotorized vehicle (e.g., mountain bikes). Refer to definition for Mechanical Transport.

Mineral Materials (Salable Minerals): Materials such as common varieties of sand, stone, gravel, pumice, pumicite, and clay that are not obtainable under the mining or leasing laws, but can be acquired through sale or free use permit under the Materials Act of 1947, as amended.

Mineral Withdrawal: A formal order that withholds federal lands and minerals from entry under the Mining Law of 1872, as amended, and closes the area to mineral location (i.e., staking mining claims) and development.

Mitigation:

(a) Avoiding the impact altogether by not taking a certain action or parts of an action.

(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

(c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.

(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

(e) Compensating for the impact by replacing or providing substitute resources or environments.

Native Species Status: Native Species Status (NSS) refers to the population status of species native to the area in which their habitats occur. The NSSs are divided into the following categories:

NSS1 **Native Species Status 1**

- Populations are greatly restricted or declining, extirpation appears possible; or ongoing significant loss of habitat.

NSS2 **Native Species Status 2**

- Populations are declining, extirpation appears possible; habitat is restricted or vulnerable, but no recent or ongoing significant loss; species may be sensitive to human disturbance
  OR
- Populations are declining or restricted in numbers and (or) distribution, extirpation is not imminent; ongoing significant loss of habitat.

NSS3 **Native Species Status 3**

- Populations are greatly restricted or declining, extirpation appears possible; habitat is not restricted, vulnerable, but no loss; species is not sensitive to human disturbance
  OR
- Populations are declining or restricted in numbers and (or) distribution, extirpation is not imminent; habitat is restricted or vulnerable, but no recent or ongoing significant loss species may be sensitive to human disturbance.
  OR
- Species is widely distributed; population status or trends are unknown, but are suspected to be stable; ongoing significant loss of habitat.

NSS4 **Native Species Status 4**

- Populations are greatly restricted or declining, extirpation appears possible; habitat is stable and not restricted.
  OR
- Populations are declining or restricted in numbers and (or) distribution, extirpation is not imminent; habitat is not restricted, vulnerable, but no loss; species is not sensitive to human disturbance
  OR
- Species is widely distributed, population status or trends are unknown, but are suspected to be stable; habitat is restricted or vulnerable, but no recent or ongoing significant loss; species may be sensitive to human disturbance
  OR
- Populations that are stable or increasing and not restricted in numbers and (or) distribution; ongoing significant loss of habitat.

Necessary Tasks: Necessary tasks are actions that support commercial or industrial uses of the public lands and which need to be accomplished by a person or organization seeking or holding an authorization from the BLM. These include tasks that are sometimes accomplished without formal written approval or in advance of receiving an authorization.

No Surface Occupancy (NSO): This is a term used to prohibit the physical presence of oil and gas operations and associated facilities on the surface of Public Lands in a specified area to protect sensitive surface resource values. The NSO provision is reserved for use in fluid mineral land use planning and allocation decisions and lease stipulations. Other terms, such as restricted area, avoidance area, exclusion area, etc., are used with non-fluid mineral functions.

Objective: A description of a desired condition for a resource. Objectives can be quantified and measured and, where possible, have established timeframes for achievement.

Off-Road Travel: Off-road travel means travel off of existing roads and trails, or driving cross-country.

Off-Highway Vehicle (OHV): Any motorized vehicle capable of, or designed for, travel on or immediately over land, water, or other natural terrain, excluding (1) any nonamphibious registered motorboat; (2) any military, fire, emergency, or law enforcement vehicle being used for emergency purposes; (3) any vehicle whose use is expressly authorized by the authorized officer, or otherwise officially approved; (4) vehicles in official use; and (5) any combat or combat support vehicle when used in times of national defense emergencies.

Off-Highway Vehicle (OHV) Management Designations: Designations apply to all off-road vehicles and over-snow vehicles regardless of the purposes for which they are being used. Emergency vehicles are excluded. The OHV designation definitions have been developed in cooperation with representatives of the U.S. Forest Service, National Park Service, and the BLM state and field office personnel. The BLM recognizes the differences between OHVs and over-snow vehicles in terms of use and impact. (See section 3.6.7 Off-highway Vehicles.)

Closed: Vehicle travel is prohibited in the area. Access by means other than motorized vehicle is permitted. This designation is used if closure to all vehicular use is necessary to protect resources, to ensure visitor safety, or to reduce conflicts.

Open: Vehicle travel is permitted in the area (both on and off roads) if the vehicle is operated responsibly in a manner not causing, or unlikely to cause, significant undue damage to or disturbance of the soil, wildlife, wildlife habitats, improvements, cultural or vegetative resources, or other authorized uses of the public lands. These areas are used for intensive OHV use where there are no compelling resource needs, user conflicts, or public safety issues to warrant limiting cross-country travel.

Limited:

a. Vehicle travel is permitted only on roads and vehicle routes that were in existence prior to the date of designation in the *Federal Register*. Vehicle travel off of existing vehicle routes is permitted only to accomplish necessary tasks and only if such travel does not result in resource damage. Random travel from existing vehicle routes is not allowed. Creation of new routes or extensions and (or) widening of existing routes are not allowed without prior written agency approval.

b. Vehicle travel is permitted only on roads and vehicle routes designated by the BLM. In areas where final designation has not been completed, vehicle travel is limited to existing roads and vehicle routes as described above. Designations are posted as follows:

   1. Vehicle route is open to vehicular travel.
   2. Vehicle route is closed to vehicular travel.

c. Vehicle travel is limited by number or type of vehicle. Designations are posted as follows:

   1. Vehicle route limited to four-wheel drive vehicles only.
   2. Vehicle route limited to motorbikes only.
   3. Area is closed to over-snow vehicles.

d. Vehicle travel is limited to licensed or permitted use.

e. Vehicle travel is limited to time or season of use.

f. Where specialized restrictions are necessary to meet resource management objectives, other limitations also may be developed.

The BLM may place other limitations, as necessary, to protect other resources, particularly in areas that motorized OHV enthusiasts use intensely or where they participate in competitive events.

Old-Growth Forest: Old-growth forests are ecosystems distinguished by old trees and related structural features. Old growth encompasses the later stages of stand development that typically differs from earlier stages in several ways, including tree size, accumulation of large dead woody material, number of canopy layers, species composition, and ecosystem function. Old-growth forest is typically distinguished by the following:

- Large-sized trees of specific species
- Wide variation in age classes and stocking levels
- Accumulations of large-sized dead standing and fallen trees
- Decadence in the form of broken or deformed tops and boles
- Multiple canopy layers
- Canopy interspaces and understory patchiness.

Old-Growth Forest Classifications for Engelmann Spruce, Douglas Fir, and Limber Pine

Engelmann Spruce – Subalpine fir (SAF Cover Type 206)

	Live Trees (Warm/Moist Environment)	Dead Trees (Warm/Moist Environment)	Live Trees (Cold/Dry Environment)	Dead Trees (Cold/Dry Environment)
Diameter Breast Height (DBH) (inches)	> or equal 20	–	> or equal 15	–
Trees/Acre	> or equal 25	–	> or equal 15	–
Age	> or equal 220	–	> or equal 150 to 180	–
Variation in Tree Diameter	Yes	–	Yes	–
Tree Decadence	Evident dead, broken, or deformed tops and (or) bole or root rot	–	> or equal 2; DBH 14; evident dead, broken, or deformed tops and (or) bole or root rot	–
Multiple Tree Canopy Layers	Yes	–	Yes	–
Standing DBH (inches)/Height (feet)	–	> or equal 12/15	–	> or equal 10/15
Standing Trees/Acre	–	> or equal 2	–	2 to 4
Down Diameter (inches)	–	> or equal 12	–	> or equal 8 or > 6
Down Pieces/Acre – Length	–	> or equal 1 – 8 feet	–	> or equal 16 to 8 feet or 100 pieces > 8 feet

Douglas-fir (SAF Cover Type 210)

	Live Trees (Higher Productivity Site)	Dead Trees (Higher Productivity Site)	Live Trees (Lower Productivity Site)	Dead Trees (Lower Productivity Site)
DBH (inches)	24	–	18	–
Trees/Acre	> or equal 15	–	10	–
Age	> or equal 200	–	200	–
Variation in Tree Diameter	Yes	–	Yes	–
Tree Decadence	Evident dead, broken, or deformed tops and (or) bole or root rot	–	> or equal 2; DBH 15; evident dead, broken, or deformed tops and (or) bole or root rot	–
Multiple Tree Canopy Layers	Yes	–	Yes	–
Standing DBH (inches)/Height (feet)	–	> or equal 20/20	–	16/10
Standing Trees/Acre	–	> or equal 1	–	0 to 3
Down Diameter (inches)	–	> or equal 12	–	> or equal 15
Down Pieces/Acre – Length	–	> or equal 0 to16 feet	–	Infrequent 4 - > or equal 8 feet

Old-Growth Forest Classifications for Engelmann Spruce, Douglas Fir, and Limber Pine (Continued)

Limber pine (SAF Cover Type 219)				
	Live Trees (Lower Timberline)	Dead Trees (Lower Timberline)	Live Trees (Montaine Woodlands)	Dead Trees (Lower Productivity Site)
DBH (inches)	> or equal 16	–	> or equal 1	–
Trees/Acre	> or equal 10	–	10	–
Age	> or equal 250	–	500	–
Variation in Tree Diameter	Yes	–	Yes	–
Tree Decadence	Evident dead, broken, or deformed tops and (or) bole or root rot	–	Evident dead, broken, or deformed tops and (or) bole or root rot	–
Multiple Tree Canopy Layers	Yes	–	No	–
Standing DBH (inches)/Height (feet)	–	N/A	–	N/A
Standing Trees/Acre	–	Few	–	Few
Down Diameter (inches)	–	N/A	–	N/A
Down Pieces/Acre – Length	–	Rare	–	Rare

Old-Growth Forest Classifications for Lodgepole Pine, Aspen, and Rocky Mountain Juniper

	Lodgepole pine (SAF Cover Type 218)		Aspen (SAF Cover Type 217)		Rocky Mountain Juniper[1] (SAF Cover Type 220)	
	Live Trees	Dead Trees	Live Trees	Dead Trees	Live Trees	Dead Trees
DBH (inches)	> or equal 11	–	> or equal 12	–	12	–
Trees/Acre	> or equal 25	–	> or equal 10 dry to 20 mesic	–	12	–
Age	> or equal 140	–	100	–	200	–
Variation in Tree Diameter	Yes	–	Yes	–	Yes	–
Tree Decadence (Trees/Acre – DBH [inches])	> or equal 2 to 11; evident dead, broken, or deformed tops and (or) bole or root rot	–	N/A	–	N/A	–
Multiple Tree Canopy Layers	Yes		Yes	–	N/A	–
Standing DBH/height feet	–	> or equal 11	–	> or equal 10/15	–	12/5
Standing Trees/Acre	–	5	–	2	–	> or equal .05
Down Diameter (inches)	–	> or equal 11	–	> or equal 8	–	> or equal 10
Down Pieces/Acre – Length	–	> or equal 50 to > or equal 8 feet	–	> or equal 10 – 10 feet	–	> or equal 2 to 5 feet

[1] Extrapolated old growth characteristics from Pinyon-Juniper Old Growth Characteristics

>	greater than
DBH	Diameter Breast Height
N/A	not available

Open: Generally denotes that an area is available for a particular use or uses. Refer to specific program definitions found in law, regulations, or policy guidance for application to individual programs.

Overgrazing: Continued heavy grazing that exceeds the recovery capacity of the forage plants and creates deterioration of the grazing lands (Valentine 1990).

Perennial Stream: A stream that flows continuously. Perennial streams generally are associated with a water table in the localities through which they flow (Prichard et al. 1998).

Pest: With the exception of vascular plants classified as invasive nonnative plant species, a pest can be any biological life form that poses a threat to human or ecological health and welfare. For the purposes of this planning effort, an "animal pest" is any vertebrate or invertebrate animal subject to control by the Animal and Plant Health Inspection Service (APHIS). APHIS is currently BLM's authorized agent for controlling "animal pests." For this reason, "animal pests" will be considered a subset of Pest.

Planning Area: A geographic area for which land use and resource management plans are developed and maintained.

Poor Topsoils: Soils that are highly erosive and (or) have low reclamation potential.

Prairie Dog Complex: A cluster of two or more prairie dog towns within 3 km of each other (Clark and Stromberg 1987, Luce 2003) and bounded by either natural or artificial barriers (Whicker and Detling 1988) that effectively isolate one cluster of colonies from interacting/interchanging with another. Prairie dogs may commonly move among colonies of a cluster, and thereby foster reproductive/genetic viability, but exhibit little emigration/immigration between clusters. A cluster may include some currently unoccupied, though physically suitable (i.e., vegetation, soils, topography etc.), lands immediately adjacent to occupied colonies that support other prairie dog-associated (ecosystem function) obligate or facultative species (e.g., swift fox, mountain plover, burrowing owl, etc.).

Prescribed Burning: Controlled application of fire to wildland fuels in either their natural or modified state under specified environmental conditions that allow the fire to be confined to a predetermined area and at the same time to produce the fire intensity and rate of spread required to attain planned resource management objectives.

Prescribed Fire: The introduction of fire to an area under regulated conditions for specific management purposes.

Priority Fish Species: Priority fish species are species considered to be sport fish and native species.

Probable Fossil Yield Classification: Geologic units in the planning area are classified according to the Probable Fossil Yield Classification, usually at the formation or member level, according to the probability of yielding resources of concern to land managers, primarily vertebrate fossils. The classification uses a ranking of 1 through 5, with Class 5 assigned to units with a high potential for fossils. Within the planning area, Class 4 and Class 5 geologic formations account for approximately 50 percent of the total acreage, including all ownerships. About 35 percent of public land in the planning area is underlain by Class 4 and Class 5 formations. The classifications are described below.

> **Class 1.** Igneous and metamorphic geologic units, or units with highly disturbed preservational environments that are not likely to contain recognizable fossil remains. Management concern is negligible for Class 1 resources and mitigation requirements are rare.

Class 2. Sedimentary geologic units that are not likely to contain vertebrate fossils or significant nonvertebrate fossils. Management concern is low for Class 2 resources and mitigation requirements are not likely.

Class 3. Fossiliferous sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence, or units of unknown fossil potential. Management concern may extend across the entire range of management. Ground-disturbing activities require sufficient assessment to determine whether significant resources occur in the area of the proposed action.

Class 4. Class 4 units are Class 5 units with a lowered risk of human-caused adverse impacts or lowered risk of natural degradation. Ground-disturbing activities require assessment to determine whether significant resources occur in the area of the proposed action and whether those actions will impact the resource. Mitigation may include full monitoring of significant localities.

Class 5. Highly fossiliferous geologic units that regularly produce vertebrate fossils or significant nonvertebrate fossils and that are at risk of natural degradation or human-caused adverse impacts. Class 5 areas receive the highest level of management focus. Mitigation of ground-disturbing actions is required and may be intense. Areas of special interest may be designated and intensely managed.

Produced Water: Produced water is groundwater removed to facilitate the extraction of minerals, such as coal, oil, or gas.

Proper Functioning Condition: See Riparian/Wetland Functionality Classification

Proper Grazing: Proper grazing is the practice of managing forage use by grazing animals at a sustainable level that maintains rangeland health. Proper grazing will maintain or increase plant cover, including residue, which acts to slow down or reduce runoff, increase water infiltration, and keep erosion and sedimentation at or above acceptable levels within the potential of ecological sites within a given geographic area (e.g., watershed, grazing allotment, etc.).

Rangeland: Land on which the native vegetation is predominantly grasses, grass-like plants, forbs, or shrubs suitable for grazing or browsing. This includes lands revegetated naturally or artificially when routine management of that vegetation is accomplished mainly through manipulation of grazing. Rangelands include natural grasslands, savannas, shrublands, most deserts, tundra, alpine communities, coastal marshes, and wet meadows.

Rangeland Health: The degree to which the integrity of the soil and ecological processes of rangeland ecosystems are sustained. Rangeland health exists when ecological processes are functioning properly to maintain the structure, organization and activity of the system over time.

Range Improvement Project: A structural improvement requiring placement or construction to facilitate management or control distribution and movement of grazing or browsing animals. Such improvements may include, but are not limited to, fences, wells, troughs, reservoirs, water catchments, pipelines, and cattleguards. The project also may include a practice or treatment that improves rangeland condition and or resource production for multiple use. Nonstructural types of projects may include, but are not limited to, seeding and plant control through chemical, mechanical, and biological means or through prescribed burning.

Raptor: A bird of prey with sharp talons and a strongly curved beak, such as hawks, falcons, owls, vultures, and eagles.

Reasonable Foreseeable Development (RFD) Scenario: An RFD Scenario for oil and gas is a long-term projection (scenario) of oil and gas exploration, development, production, and reclamation activity. The RFD covers oil and gas activity in a defined area for a specified period of time. The RFD projects a baseline scenario of activity assuming all potentially productive areas can be open under standard lease terms and conditions, except those areas designated as closed to leasing by law, regulation or executive order. The baseline RFD scenario provides the mechanism to analyze the effects that discretionary management decisions have on oil and gas activity. The RFD also provides basic information that is analyzed in the National Environmental Policy Act (NEPA) document under various alternatives (BLM 2004).

> **Unconstrained RFD Scenario:** The baseline RFD scenario. No management prescriptions management proposed conditions and (or) restrictions are applied when projecting future activities. Where legislatively imposed restrictions are applied to analyzed lands, those restrictions are considered when projecting future activities.
>
> **Constrained RFD Scenario:** An RFD scenario projected for each proposed alternative. Management prescriptions proposed for each alternative are considered when projecting future activities under the RFD scenario for each alternative. Where legislatively imposed restrictions are applied to analyzed lands, those restrictions are considered when projecting future activities for each alternative.

Recreation Management Areas: Recreation management areas are units within a planning area guiding recreation management on public lands having similar recreation-related issues and concerns. There are two types of recreation management areas, extensive and special.

> **Extensive Recreation Management Areas (ERMAs):** These are areas where dispersed recreation is encouraged and where visitors have a freedom of recreational choice with minimal regulatory constraint.
>
> **Special Recreation Management Areas (SRMAs):** A public lands unit identified in land use plans to direct recreation funding and personnel to fulfill commitments made to provide specific, structured recreation opportunities (i.e., activity, experience, and benefit opportunities). Both land use plan decisions and subsequent implementing actions for recreation in each SRMA are geared to a strategically identified primary market—destination, community, or undeveloped.

Reserve Pit: A pit that is intrinsically related to well drilling and is used to hold drilling fluids and cuttings during the well drilling.

Resource Damage: This type of damage is defined as leaving signs of vehicle use, such as wheel ruts in wet meadows, visual scars on hillsides, or soil erosion. Additional examples include surface disturbance that causes the loss of vegetative cover, degradation of wildlife habitats, the creation of new roads, and the introduction of noxious weeds. Damage to vegetation also includes crushing or uprooting trees and shrubs. The determination of whether resource damage has occurred is at the discretion of Field Managers and law enforcement personnel.

Restricted Disposal: Parcels identified for restricted disposal may be disposed of under the Recreation and Public Purposes Act (by example), may limit the disposal to a particular type of entity capable of preserving the resource values, or may include the use of covenants in the deed or land-sale patent to ensure the resource values are protected.

Riparian/Wetland Functionality Classification:

Desired Plant Community (DPC): Of the several plant communities that may occupy a site, the DPC is the community that has been identified through a management plan to best meet the plan's objectives for the site. At a minimum, it must protect the site.

Functional At-Risk: Riparian/wetland areas that are in functional condition, but an existing soil, water, or vegetation attribute makes them susceptible to degradation.

Potential Natural Community (PNC): The biotic community that would become established if all successional sequences were completed without interference by humans under the present environmental conditions. Natural disturbances are inherent in development. PNCs can include naturalized nonnative species.

Proper Functioning Condition: A riparian or wetland area is considered to be in proper functioning condition when adequate vegetation, landform, or large woody debris is present to do the following:

- Dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality
- Filter sediment, capture bedload, and aid floodplain development
- Improve floodwater retention and groundwater recharge
- Develop root masses that stabilize stream banks against cutting action
- Develop diverse ponding and channel characteristics to provide the habitats and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses
- Support greater biodiversity.

Nonfunctional: Riparian or wetland areas that clearly are not providing adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows and, thus, are not reducing erosion, improving water quality, and so on, as listed above. The absence of certain physical attributes, such as a floodplain where one should be, is an indicator of nonfunctioning conditions.

Unknown: Riparian or wetland areas that the BLM lacks sufficient information on to make any form of determination.

Rights-of-Way (ROW): An ROW grant is an authorization to use a specific piece of public land for a specific project, such as roads, pipelines, transmission lines, and communication sites. The grant authorizes rights and privileges for a specific use of the land for a specific period of time.

ROW Avoidance Areas: Areas where negative routing factors exist. ROW either will not be granted in these areas or—if granted—will be subject to stringent terms and conditions. In other words, ROW would be *restricted* (but not necessarily prohibited) in these avoidance areas.

Salable Minerals (Mineral Materials): Common variety of minerals on public lands, such as sand and gravel, used mainly for construction. Salable minerals are disposed of by sales to the public or free-use permits to government agencies or nonprofit organizations.

Seasonal Ranges: The Wyoming Game and Fish Department has identified various ranges for big game species. These ranges are defined as follows:

> **Summer or Spring-Summer-Fall:** A population or portion of a population of animals uses the documented habitats within this range annually from the end of previous winter to the onset of persistent winter conditions.
>
> **Severe Winter Relief:** A documented survival range, which may or may not be considered a crucial range area as defined above. It is used to a great extent, but only in extremely severe winters. It may lack habitat characteristics that would make it attractive or capable of supporting major portions of the population during normal years, but is used by and allows at least a significant portion of the population to survive the occasional extremely severe winter.
>
> **Winter:** A population or portion of a population of animals uses the documented suitable habitat sites annually within this range in substantial numbers during the winter period only.
>
> **Winter/Yearlong:** A population or a portion of a population of animals makes general use of the documented suitable habitat sites within this range on a year-round basis. During the winter months there is a significant influx of additional animals into the area from other seasonal ranges.
>
> **Yearlong:** A population or substantial portion of a population of animals makes general use of the suitable documented habitat sites within the range on a year-round basis. On occasion, animals may leave the area under severe conditions.
>
> **Parturition Areas:** Documented birthing areas, commonly used by females, that include calving areas, fawning areas, and lambing grounds. These areas may be used as nurseries by some big game species.

Section 106 of National Historic Preservation Act: "The head of any Federal agency having direct or indirect jurisdiction over a proposed federal or federally assisted undertaking in any state and the head of any federal department or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. The head of any such federal agency shall afford the Advisory Council on Historic Preservation established under Title II of this Act a reasonable opportunity to comment with regard to such undertaking" (16 United States Code 47 df).

Sensitive Sites or Resources: Sensitive sites or resources refer to significant cultural resources that are eligible or may be eligible for nomination to the National Register of Historic Places.

Sensitive Species: Species designated as sensitive by the BLM State Director include species that are under status review, have small or declining populations, live in unique habitats, or require special management (BLM 2001). BLM Manual 6840 provides policy and guidance for special status species management. The BLM Wyoming Sensitive Species Policy and List are provided in a memorandum updated annually. Primary goals of the BLM Wyoming policy include maintaining vulnerable species and habitat components in functional BLM ecosystems and preventing a need for species listing under the Endangered Species Act.

Seral Stage: One of a series of plant communities that follows another in time on a specific ecological site.

Setting: Setting is the physical environment of a historic property and how the property evokes a sense of feeling and association with past events. Accordingly, setting referees to the **character** of the place in which the property played its historic role. It involves **how**, not just where, the property is situated and its relationship to surrounding features and open space. These features and their relationships should be considered not only within the exact boundaries of the property, but also between the property and its surroundings.

Significant Cultural Sites: The planning area contains sites that are identified for special management objectives because of their unusual historical, cultural, scientific, or traditional values among the many other sites in the planning area that are evaluated eligible to the National Register of Historic Places. The significant cultural sites currently identified are the Bridger Antelope Trap, Emigrant Spring/Slate Creek, Emigrant Spring/Dempsey, Johnston Scout Rock, Alfred Corum and Nancy Hill Graves, Pine Grove Emigrant Camp, Rocky Gap Trail Interpretive Site, Bear River Divide Trail Interpretive Site, and Gateway Petroglyphs viewshed. As other sites meeting these criteria or values are identified, BLM may elect to include them as significant cultural sites.

Snowmobile: Motor vehicle with a revolving tread in the rear and steerable skis in the front, for traveling over snow.

Soil Crust, Biological: A mosaic of bacteria, algae, lichens, mosses, and microfungi that weave through the top few centimeters of soil, forming a matrix that stabilizes and protects soil surfaces from erosive forces. Crusts are well adapted to severe growing conditions, but poorly adapted to compressional disturbances from vehicles, people, or animals. Once soil crusts are damaged or destroyed, they recover very slowly, especially in arid climates (BLM 2001c).

Soil Crust, Chemical: Firm layer on the soil surface generally formed from the deposition of inorganic chemicals like sodium or calcium chloride that precipitate from irrigation water or soil water lower in the profile. These crusts typically reduce water infiltration and prevent seedling emergence.

Soil Crust, Physical: Firm layer on the soil surface, generally formed in coarse sandy soils with low organic matter content, high salinity, and high alkalinity. Physical crusts may form when exposed to raindrop splash on bare soil or as a result of compaction. Soils with physical crusting typically reduce water infiltration and can prevent seedling emergence (BLM 2001c).

Special Recreation Management Areas (SRMAs): A public lands unit identified in land use plans to direct recreation funding and personnel to fulfill commitments made to provide specific, structured recreation opportunities (i.e., activity, experience, and benefit opportunities). Both land use plan decisions and subsequent implementing actions for recreation in each SRMA are geared to a strategically identified primary market—destination, community, or undeveloped.

Special Status Species: Special status species are species proposed for listing, officially listed as threatened or endangered, or are candidates for listing as threatened or endangered under the provisions of the Endangered Species Act; those listed by a state in a category, such as threatened or endangered, implying potential endangerment or extinction; and those designated by the State Director as sensitive (BLM 2001).

Split-Estate: Surface land and mineral estate of a given area under different ownerships. Frequently, the surface will be privately owned and the minerals federally owned.

Standard Practices: These practices are applied to surface-disturbing activities and are statements of guidelines and techniques for establishing statewide (or national) consistency in avoiding and mitigating environmental impacts and resource conflicts. These practices have been developed through field experience, planning analyses, and legal or regulatory directives. They emphasize the responsibility of the

Bureau of Land Management (BLM) to ensure that good construction practices are used on public lands, and that they apply to all surface-disturbing activities (BLM 2007a).

State-Listed Species: Species proposed for listing or listed by a state in a category implying, but not limited to, potential endangerment or extinction. Listing is either by legislation or regulation.

Stipulation: The least restrictive condition or requirement attached to a lease or contract that meets a resource protection objective.

Surface-disturbing Activity: An authorized action that alters the vegetation, surface/near surface soil resources, and (or) surface geologic features beyond natural site conditions and on a scale that affects other public land values.

Surface Water Classes and Uses: The following water classes are a hierarchical categorization of waters according to existing and designated uses. Except for Class 1 waters, each classification is protected for its specified uses plus all the uses contained in each lower classification. Class 1 designations are based on value determinations rather than use support and are protected for all uses in existence at the time of or after designation. There are four major classes of surface water in Wyoming with various subcategories within each class (see "Wyoming Surface Water Classification List" for current listing).

(a) Class 1, Outstanding Waters. Class 1 waters are those surface waters in which no further water quality degradation by point source discharges other than from dams will be allowed. Nonpoint sources of pollution shall be controlled through implementing appropriate best management practices. Pursuant to Section 7 of these regulations, the water quality and physical and biological integrity that existed on the water at the time of designation will be maintained and protected. In designating Class 1 waters, the Environmental Quality Council shall consider water quality, aesthetic, scenic, recreational, ecological, agricultural, botanical, zoological, municipal, industrial, historical, geological, cultural, archeological, fish and wildlife, the presence of substantial quantities of developable water, and other values of present and future benefit to the people.

(b) Class 2, Fisheries and Drinking Water. Class 2 waters are waters, other than those designated as Class 1, that are known to support fish or drinking water supplies or where those uses are attainable. Class 2 waters may be perennial, intermittent, or ephemeral. Five subcategories of Class 2 waters exist.

(c) Class 3, Aquatic Life Other than Fish. Class 3 waters are waters other than those designated as Class 1 that are intermittent, ephemeral, or isolated waters, and because of natural habitat conditions, do not support nor have the potential to support fish populations or spawning or certain perennial waters that lack the natural water quality to support fish (e.g., geothermal areas). Class 3 waters provide support for invertebrates, amphibians, or other flora and fauna that inhabit waters of the state at some stage of their life-cycles. Uses designated on Class 3 waters include aquatic life other than fish, recreation, wildlife, industry, agriculture, and scenic value. Generally, waters suitable for this classification have wetland characteristics; such characteristics will be a primary indicator used in identifying Class 3 waters. There are four subcategories of Class 3 waters.

(d) Class 4, Agriculture, Industry, Recreation, and Wildlife. Class 4 waters are waters other than those designated as Class 1 where it has been determined that aquatic life uses are not attainable pursuant to the provisions of Section 33 of these regulations. Uses designated on Class 4 waters include recreation, wildlife, industry, agriculture, and scenic value (Wyoming DEQ 2002).

Timing Limitation: A restriction on the use and (or) activities on the land surface for a specified time to mitigate anticipated impacts or achieve an identified level of resource protection. The restriction may be the result of lease stipulations, surface management agency review and environmental analysis of an action, Notice to Lessees, Onshore Orders, or regulations.

Traditional Cultural Property (TCP): A cultural property that is eligible for inclusion in the National Register of Historic Places because of its association with a living community's cultural practices or beliefs that (a) are rooted in that community's history; and (b) are important in maintaining the community's continuing cultural identity (BLM 2007b).

Trails: The term "trails," when used in the phrase "roads and trails" in association with off-highway vehicle designations, means motor vehicle trails only. These include distinct two-track vehicle trails or single-track motorcycle trails created by the passage of motor vehicles and which receive continuous use. Cow paths, foot trails, mountain bike trails, and game trails are not motor vehicle trails and motor vehicle travel is not allowed on them. Vehicle traces created by the unauthorized passage of a few motor vehicles are not legal motor vehicle trails.

Vegetative Diversity: The variety of vegetative types in an area, including species, the genetic differences among species and populations, the communities and ecosystems in which vegetation types occur, and the structure and seral stage of these communities. Vegetative diversity includes rare as well as common vegetative types, and typically supports a diverse array of animal species and communities.

Viewshed: A viewshed is used in Visual Resource Management to describe "…landscape that can be seen under favorable atmospheric conditions from a viewpoint (key observation point) or along a transportation corridor" (BLM 1984).

Visual Resources: The visible physical features of a landscape (topography, water, vegetation, animals, structures, and other features) that constitute the scenery of an area.

Visual Resource Management (VRM) Classes:

> **Class I.** The objective of this class is to maintain a landscape setting that appears unaltered by humans. It is applied to wilderness areas, some natural areas, wild portions of wild and scenic rivers, and other similar situations in which management activities are to be restricted.
>
> **Class II.** The objective of this class is to design proposed alterations so as to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
>
> **Class III.** The objective of this class is to design proposed alterations so as to partially retain the existing character of the landscape. Contrasts to the basic elements (form, line, color, and texture) caused by a management activity may be evident and begin to attract attention in the characteristic landscape; however, the changes should remain subordinate to the existing characteristic landscape.
>
> **Class IV.** The objective of this class is to provide for management activities that require major modification of the existing character of the landscape. Contrasts may attract attention and be a dominant feature of the landscape in terms of scale; however, changes should repeat the basic elements (form, line, color, and texture) inherent in the characteristic landscape.

Rehabilitation Area. Change is needed or change may add acceptable visual variety to an area. This class applies to areas where the naturalistic character has been disturbed to a point at which rehabilitation is needed to bring it back into character with the surrounding landscape. This class would apply to areas identified in the scenic evaluation where the quality class has been reduced because of unacceptable cultural modification. The contrast is inharmonious with the characteristic landscape. It also may be applied to areas having the potential for enhancement; i.e., add acceptable visual variety to an area or site. It should be considered an interim or short-term classification until one of the other VRM class objectives can be reached through rehabilitation or enhancement. The desired VRM class should be identified.

Wildfire: Any natural fire ignition occurring on wildland that neither meets management objectives nor occurs within a prescribed fire area, thus requiring a suppression response.

Wildlife-disturbing Activity: Authorized activities that may cause displacement of or excessive stress to wildlife during critical life stages or during periods of severe weather conditions. Wildlife-disturbing activities include human presence, noise, and activities using motorized vehicles or equipment.

Withdrawal: Removal or withholding of public lands, by statute or Secretarial order, from operation of some or all of the public land laws. A mineral withdrawal includes public lands potentially valuable for leasable minerals, precluding the disposal of the lands, except with a mineral reservation clause, unless the lands are found not to contain a valuable deposit of minerals. A mineral withdrawal is the closing of an area to mineral location and development activities.

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